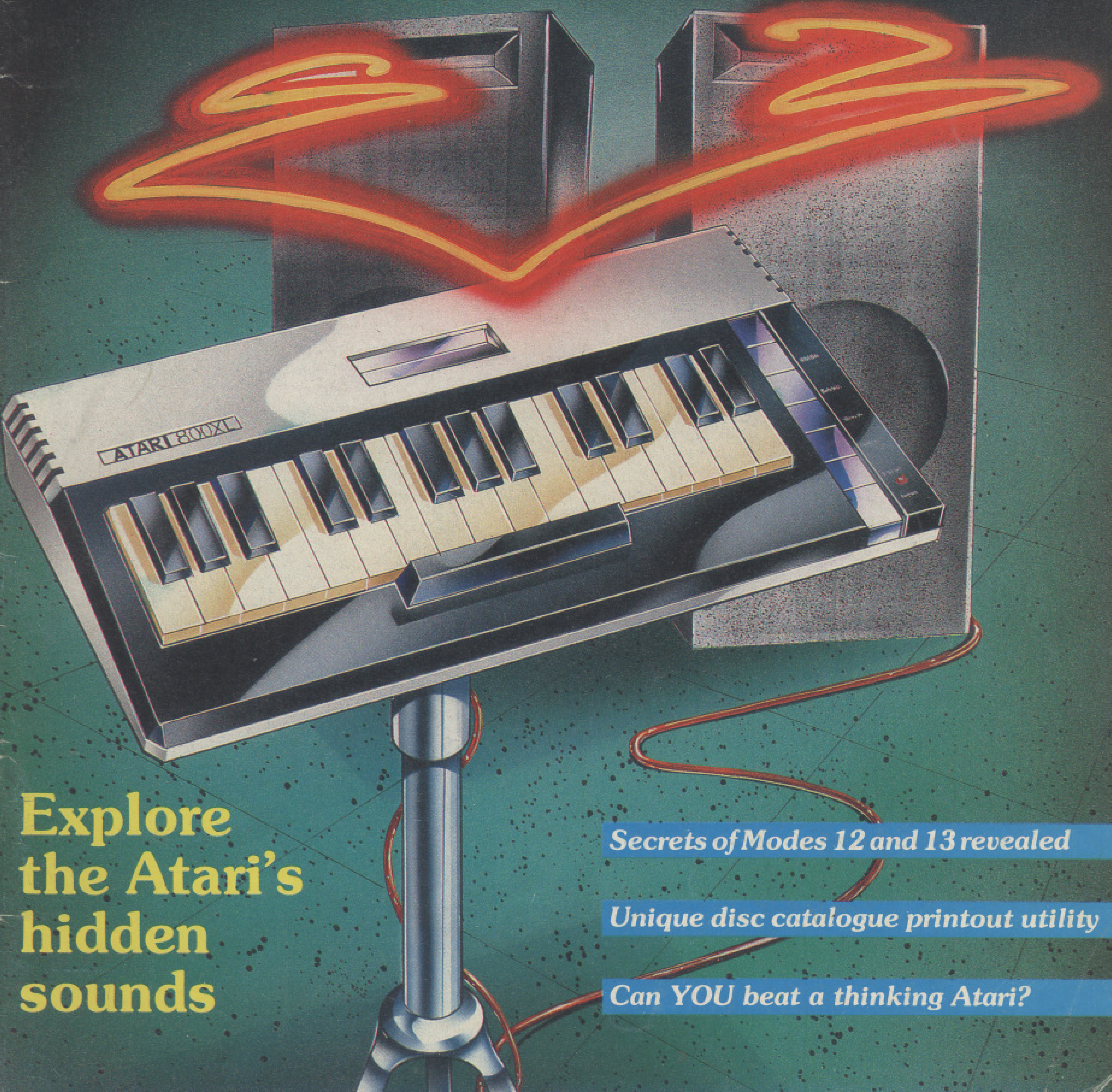
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Vol. 1 No. 12 April 1986 £1

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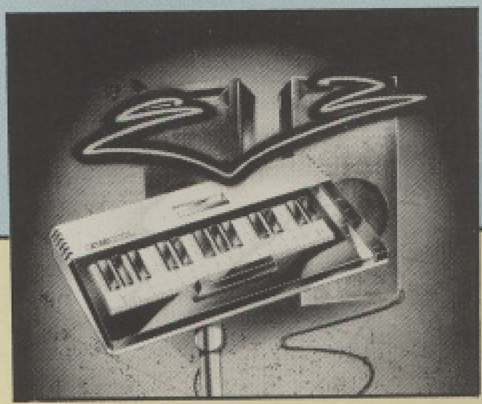
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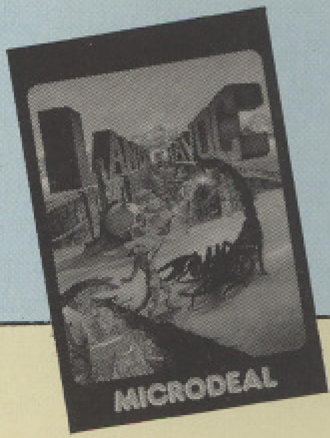
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Contents

Atari denies 8 bit customers ignored

ATARI has denied that it is treating 8 bit customers as poor relations. The criticism was levelled against Atari during a poll of 100 users drawn equally from the ranks of 800XL and 130XE owners.

More than 80 felt the company had turned its back on the 8 bit machines in favour of the ST range.

Typical of the comments was: "The arrival of the ST machines meant that Atari just doesn't want to know us any more. It is annoying when you think that although the ST may be the icing on the cake, we make up the cake itself".

When the dissatisfaction among 8 bit users was brought to the attention of Atari boss Max Bambridge, he was quick to give assurances that the complaints were unfounded.

However he did admit the publicity that has surrounded the arrival of the ST machines has tended to put the less powerful models in the shade.

Sensitive

"We are very sensitive to this", he told *Atari User*, "for in no way do we want any of our customers to feel as though they are being treated any less fairly than others.

"The truth of the matter is that we are totally committed to the 8 bit market – just as we are to the 16 bit".

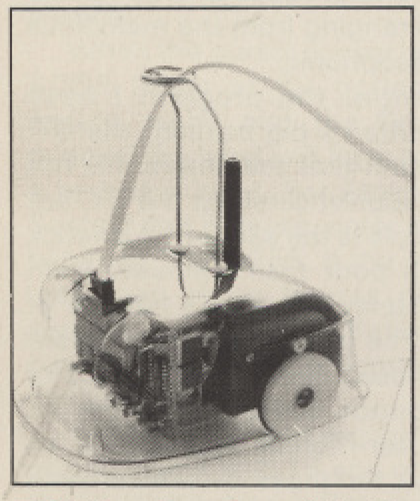
Max Bambridge points to the launching of a new low cost colour monitor for the 130XE as being an example of the company's on-going support.

"It is our intention to see that the 130XE remains the leader in its own sector of the market", he said.

As part of this plan the Atari UK boss has pledged his support for companies wishing to develop projects for the 8 bit machines.

"We are eager to help anyone in this area, whether it be with the loan of development machines, programming tools or just advice", he said.

"That's how important the 8 bit market is to us".



THIS Atari version of the Zero 2 robot has been launched by Intergalactic Robots. It is an educational model designed to teach users the fundamentals of robotics and can be used as a Logo turtle. It costs £119.95.

ST TOOLBOX

A COMMAND line processor has been released for the 520ST by Paperlogic.

Called the ST-Toolbox it is a productivity tool aimed at enhancing the machine's efficiency and performance.

It costs £29.95.

Backing for Atari projects

HALF a million pounds is available for projects for the Atari range. The man with the money awaiting investment is Barry Krite, managing director of DataStar Systems.

"I am prepared to invest in likely looking products, existing ones that may need a boost, or any which still may be at the idea stage", he says.

"As a nation we are notoriously good at ideas but terrible at putting them into practise – often through lack of capital".

DataStar Systems manufacture the Magic Modem. It was this project with its heavy development costs which set Barry Krite thinking about investing in his own personal venture capital fund.

Flounder

Remembering the problems he had, he said: "We realise how easy it could be even for an exceptional product to flounder if you did not have enough capital behind it.

"Really there is no one out there you can turn to if you do not have money available.

"That is why I decided to make the offer, not just for profit for myself, but to help the industry as a whole".

GAMES BOOM IS ON ITS WAY

THIS year will witness a massive increase in the amount of software available for the Atari 8 bit machines, the 800XL and 130XE.

An industry survey carried out by *Atari User* has revealed that the boom is already underway, with at least 100 new titles expected to come on to the market in the next few months.

More programs – and more outlets stocking them – should end the longstanding complaint by Atari 8 bit enthusiasts that software for their machines is often hard to find. There are two main reasons for the brighter outlook.

One is the deal with High Street giants Dixons and Currys which increased the 800XL user base by 100,000 at Christmas. The second release here of a host of 8 bit titles from the United States.

Software Express distribution director Ken Howells told *Atari User:* "A lot of software companies have suddenly realised there is a big market for products for the Atari 8 bit range.

"Firms that previously wouldn't have bothered to convert their titles for the Atari are now doing so in increasing numbers and programmers all over the country are being snowed under with conversion work.

"American software houses are licensing large numbers of their Atari 8 bit programs to British firms. Some are even opening their own offices over here.

"We are in the process of introducing 50 new titles to this country, many originating in the USA, and I expect that total to be easily doubled by releases from other companies.

"Two or three new outlets a week are contacting us to order Atari programs. If any users have problems getting Atari 8 bit software these days they should change their retailer".

Distributor Microdeal reports that all its Atari 8 bit software is selling extremely well.

A spokeswoman said: "We carry six titles at the moment. Perhaps we should be handling more – there's obviously a big demand for them".

Silica Shop is currently releasing 30 new products, many of them American imports for Atari 8 bit machines.



▶ Activate ▶ Atari's ▶ hidden ▶ depths ▶ of sound

STEPHEN WILLIAMSON invites you to turn up the music

INSPIRED by years of listening to the electronic sounds of rock groups like Tangerine Dream and Pink Floyd, I have written a synthesiser program that activates the hidden depths of the Atari sound chip.

It may not be up to the standard of Jean Michael Jarre, who uses electronic sound generating equipment costing many thousands of pounds, but the program is certainly fun to play with.

For best results connect your Atari directly to your stereo system via the monitor output and suitable leads. Alternately use a television with an earphone output and connect this to your amplifier. Turn the volume up.

Fortunately, you don't have to know a great deal about music or even computers to operate the program and produce a wide variety of sound ranging from the melodious to the cacophonic.

To control the program I have imitated Atari's big brother, the ST. Well I admit that the program is not quite as sophisticated as the ST, but the principle is the same. The joystick acts as a poor man's mouse. Each screen display presents a number of options. The joystick moves a cursor to the chosen option and a press of the fire button activates that option.

This user-friendly approach is an ideal way for those unfamiliar with computers or the qwerty keyboard to operate the program. Inverse characters indicate that an option has been activated.

For example, go to the One Channel Sound page and you will find that the sound is pre-set to a 64kHz main base clock and pure sound. To switch on other sound attributes the cursor can be positioned anywhere on the line where the chosen option appears.

The program will not allow you to switch on incompatible options. For instance, if you switch on Distortion 2 any other distortion option previously turned on will automatically be cancelled.

When the desired combination of sound attributes has been chosen place the cursor over the Play box and press the fire button. Control then passes to the middle two rows of the keyboard.

The display at the bottom of the sound pages shows how the musical

notes have been allocated to the keys in a similar way to the piano keyboard with the sharps positioned above the natural notes.

The musical scale is true for the preset sounds, but other sound options may give various degrees of discord.

To exit from the play mode press the Select key and a keyboard music key at the same time. To return to the main menu go to the Return box.

The ADSR section enables you to define a sound envelope. If you are unfamiliar with the ADSR envelope study Figure I which shows a graph of the sound envelope.

Attack is the time taken for a note to reach full volume and Decay the time taken to reach the Sustain Level. Sustain is a measure of how long the note stays at the sustain volume level before the release when it fades to silence.

When the cursor is over one of the ADSR labels at the bottom of the option menu and the fire button pressed the label will flash to prompt a keyboard input. For Attack, Decay, Sustain and Release, enter a value of between 1 and 255. If the number is less than three figures press the joystick button or the Return key to pass control of the program back to the joystick.

The Sustain Level requires a value of between 1 and 14 and only needs the joystick button or Return key to be pressed if a single figure is entered.

The program will not allow an invalid number to be entered in the ADSR envelope parameters. To demonstrate the ADSR sound envelope enter Attack 2, Decay 10, Sustain 40, Release 50 with a Sustain Level of 9 to produce a crisp piano type sound.

To obtain a woodwind type sound try Attack 20, Decay 30, Sustain 50 and Release 50 with a Sustain Level of 8.

A snare drum type sound is made by setting the 64kHz clock (option 1), the 1.79 mHz clock (option 4) the Distortion 3 (option 8) and the 9 bit poly counter (option 9), followed by Attack 5, Decay 5, Sustain 5, Release 10 and Sustain Level 6.

In order to understand what each of the program options does it is useful to know something about how the Atari sound chip functions. (For a more detailed introduction to the subject see the May and June 1985 articles in *Atari User* by Pete Bibby.)

In Basic there is just one command to control sound – called appropriately enough SOUND. As well as accessing the sound system by means of this command it is possible to work directly on the sound registers which are found at addresses 53760 to 53768.

53760,53762 53764 and 53766 control the pitch of sound channels 0 to 3 and addresses 53761,53763, 53765 and 53767 affect the distortion and volume for each sound channel.

For example, a sound can be switched on using a command such as SOUND 0,90,10,10 or alternatively the same sound can be achieved by POKE 53760,90 followed by POKE 53761,234.

In the program the play mode runs generated using a 64kHz system. The lower the frequency of the clocking, the lower the note that results. Therefore lowering the 64kHz clock to 15kHz by choosing option 2 changes AUDCTL to give notes of a lower pitch.

The 1.79mHz clock (option 4) gives notes of a very high frequency.

The high bandpass filter (option 3) filters out lower frequency sound to give a higher tone.

During the distortion options (5 to 8) the distortion effect is achieved by something known as a poly-counter which merges random waveforms with pure sounds.

The value of the poly-counter affects the speed of these waveforms. Normally the Atari is set to a 17 bit poly-counter.

To see this in operation, switch on distortion number 3 in the One

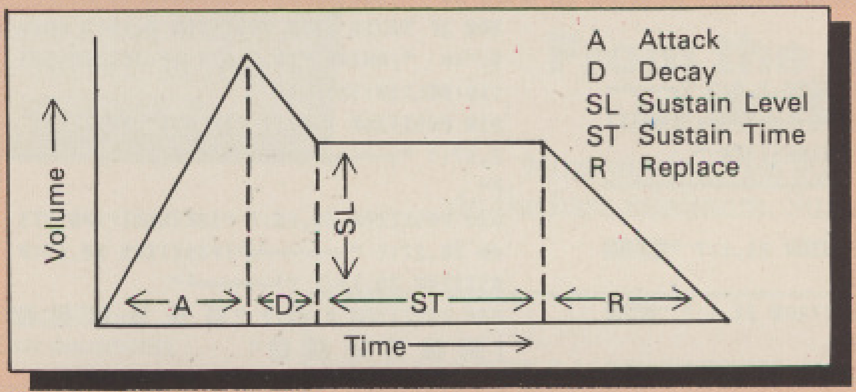


Figure I: The ADSR envelope

a machine code routine that detects which key has been pressed and allocates a pitch value which is stored in the sound channel 0 register at address 53760 and, in the case of the two channel sound, calculates a pitch value an octave less which is put in the sound channel 1 register at address 53762.

This routine also handles the timing and volume controls during the ADSR section.

Options 5 to 8 decide which distortion value is placed in the distortion and volume registers at address 53761 – if the two channel mode is chosen a similar distortion and volume value is placed in address 53763.

Address 53768 is known as AUDCTL and affects the sound channels in ways that cannot be accessed directly from Basic. Options 1 to 4 and option 9 change the value contained in this address to give various effects.

Normally the Atari sound is

Channel mode, but without the 9 bit poly-counter. Enter the Play mode and press Key L.

Exit from the Play mode and switch on the 9 bit poly-counter. Again press key L in the Play mode and you will notice how the change of poly-counter speed affects the distorted sound.

Of course when using pure sound the 9 bit poly-counter has no effect, and in other distortion and poly counter combinations, the change may be difficult to detect.

Option 10, Repeat, is used only during the ADSR section and, as the name implies, causes notes to be repeated rapidly.

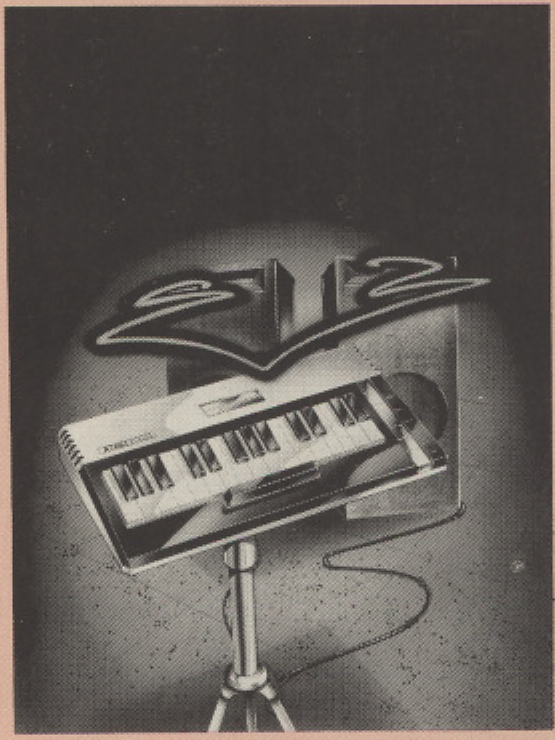
The best way to use a program like this is to experiment and see what you can find among the Atari's vast range of sounds. Have fun, but spare a thought for your neighbours.

Note: The program will not run on a 16k machine.



```
10 REM *** SOUND SYNTHESISER ***
20 REM *** by Stephen Williamson ***
30 OPEN #1,4,0,"K:":POKE 106,152:GRAPHICS 0:? "Data loading...":GOSUB 1600
40 GRAPHICS 0:SETCOLOR 2,12,0:CLR
50 GOSUB 1260
60 ? CHR$(125):POSITION 10,0:? "┌───────────────┐":POSITION 10,1:? "|SOUND SYNTHESISER|"
70 POSITION 10,3:? "by Stephen Williamson"
80 POSITION 10,2:? "└───────────────┘"
90 POSITION 10,8:? "1. ONE CHANNEL SOUND"
100 POSITION 10,10:? "2. TWO CHANNEL SOUND"
110 POSITION 10,12:? "3. A.D.S.R. SOUND"
120 GOSUB 270
130 Y1=Y
140 IF Y=8 OR Y=10 OR Y=12 THEN GOTO 160
150 GOTO 120
160 ? CHR$(125):POSITION 2,0:? "┌──────────────────────────┐":POSITION 2,1:? "|SOUND SYNTHESISER-"
170 POSITION 2,2:? "└──────────────────────────┘"
180 IF Y=8 THEN POSITION 21,1:? "ONE CHANNEL SOUND|":OCT=0
190 IF Y=10 THEN POSITION 21,1:? "TWO CHANNEL SOUND|":OCT=1
200 IF Y=12 THEN POSITION 21,1:? "A.D.S.R.ENVELOPE |":ADSR=1
210 X=8:Y=4
220 GOSUB 370
230 REM *** CONTROL LOOP ***
240 GOSUB 270
250 GOSUB 580
260 POKE 85,X:POKE 84,Y:GOTO 240
270 REM *** MOVE CURSOR ***
280 ST=STICK(0):FOR DELAY=1 TO 10:NEXT DELAY
290 X=X+(ST=7)-(ST=11):Y=Y+(ST=13)-(ST=14)
300 IF STRIG(0)=0 THEN FOR DEL=1 TO 30:NEXT DEL:RETURN
310 IF X<0 THEN X=39
320 IF Y<0 THEN Y=23
330 IF X>39 THEN X=0
340 IF Y>23 THEN Y=0
350 POKE 85,X:POKE 84,Y:? CHR$(158);
360 GOTO 270
370 REM *** PRINT MENU ***
380 POSITION 10,4:? AU2$
390 POSITION 10,5:? AU3$
400 POSITION 10,6:? AU5$
410 POSITION 10,7:? AU7$
420 POSITION 10,8:? AU7$
430 POSITION 10,8:? AU10$
440 POSITION 10,9:? AU11$
450 POSITION 10,10:? AU13$
460 POSITION 10,11:? AU15$
470 POSITION 10,12:? AU17$
480 IF Y1=12 THEN POSITION 9,13:? AU19$
490 IF Y1=12 THEN POSITION 2,15:? AU22$;"10  ";AU24$;"10  ";AU26$;"10  "
500 IF Y1=12 THEN POSITION 2,16:? AU28$;"10  ";AU30$;"10 ":ATT=10:DEC=10:SUS=10:REL=10:SUSL=10
510 POSITION 2,18:? "|PLAY|":POSITION 2,17:? "┌────┐":POSITION 2,19:? "└────┘"
520 POSITION 30,18:? "|RETURN|":POSITION 30,17:? "┌──────┐":POSITION 30,19:POSITION 30,19:? "└──────┘"
530 POSITION 2,22:? "A S D F G H | J K L ; + *"
540 POSITION 2,20:? "   A#    C# D#  F# G# A#    C# D#"
550 POSITION 2,21:? "  W    R T  U I O    - ="
560 POSITION 2,23:? " A  B  C  D  E  F  G  A  B  C  D  E ";
570 RETURN
580 REM *** CHANGE SOUND REGISTERS ***
590 IF Y=4 OR Y=5 THEN IF AUD1=0 THEN AUD1=1:POSITION 10,4:? AU1$:POSITION 10,5:? AU4$:RETURN
600 IF Y=4 OR Y=5 THEN IF AUD1=1 THEN AUD1=0:POSITION 10,4:? AU2$:POSITION 10,5:? AU3$:RETURN
610 IF Y=6 AND AUD2=1 THEN AUD2=0:POSITION 10,6:? AU5$:RETURN
620 IF Y=6 AND AUD2=0 THEN AUD2=1:POSITION 10,6:? AU6$:RETURN
630 IF Y=7 AND AUD3=1 THEN AUD3=0:POSITION 10,7:? AU7$:RETURN
640 IF Y=7 AND AUD3=0 THEN AND3=1:POSITION 10,7:? AU8$:RETURN
650 IF Y>=8 AND Y<=11 THEN POSITION 10,8:? AU9$:POSITION 10,9:? AU11$:POSITION 10,10:? AU13$:POSITION 10,11:? AU15$
660 IF Y>=8 AND Y<=11 THEN AUD4=0:AUD5=0:AUD6=0:AUD7=0
670 IF Y=8 THEN POSITION 10,8:? AU10$:AUD4=1:RETURN
680 IF Y=9 THEN POSITION 10,9:? AU12$:AUD5=1:RETURN
690 IF Y=10 THEN POSITION 10,10:? AU14$:AUD6=1:RETURN
700 IF Y=11 THEN POSITION 10,11:? AU16$:AUD7=1:RETURN
710 IF Y=12 AND AUD8=0 THEN AUD8=1:POSITION 10,12:? AU18$:RETURN
720 IF Y=12 AND AUD8=1 THEN AUD8=0:POSITION 10,12:? AU17$:RETURN
730 IF Y=13 AND Y1=12 AND AUD9=0 THEN AUD9=1:POSITION 9,13:? AU20$:RETURN
740 IF Y=13 AND Y1=12 AND AUD9=1 THEN AUD9=0:POSITION 9,13:? AU19$:RETURN
750 IF Y=15 OR Y=16 THEN IF Y1=12 THEN GOSUB 970:RETURN
760 IF Y>16 AND Y<20 AND X<9 THEN GOSUB 790:RETURN
770 IF Y>16 AND Y<20 AND X>20 THEN POP:GOTO 40
780 RETURN
790 REM *** PLAY & ***
800 REM *** POKE SOUND REGISTERS ***
810 POKE 53768,0:AUD=0:REP=0
820 IF AUD1=1 THEN AUD=AND+1
830 IF AUD2=1 THEN AUD=AUD+4
840 IF AUD3=1 THEN AUD=AUD+64
850 IF AUD4=1 THEN DIS=160
860 IF AUD5=1 THEN DIS=192
870 IF AUD6=1 THEN DIS=64
880 IF AUD7=1 THEN DIS=128
890 IF AUD8=1 THEN AUD=AUD+128
900 IF AUD9=1 THEN REP=1
910 IF ADSR=0 THEN DIS=DIS+15
920 POKE 53768,AUD:POKE 764,255
930 IF PEEK(53279)=5 THEN POKE 53768,0:POKE 53761,0:POKE 53763,0:X=8:Y=18:RETURN
940 A=USR(39936,OCT,ADSR,REP,DIS,ATT,DEC,SUSL+DIS,SUS,REL)
950 GOTO 930
960 REM *** SET UP ADSR ENVELOPE ***
970 POKE 764,255:CH=0:FIG=0:FIG(1)=0:FIG(2)=0:FIG(3)=0
980 IF X<12 AND Y=15 THEN XX=8:POSITION 2,15:? AU21$:GOSUB 1240:POSITION 2,15:? AU22$:GOSUB 1240
990 IF X>11 AND X<18 AND Y=15 THEN XX=18:POSITION 13,15:? AU23$:GOSUB 1240:POSITION 13,15:? AU24$:GOSUB 1240
1000 IF X>19 AND Y=15 THEN XX=30:POSITION 23,15:? AU25$:GOSUB 1240:POSITION 23,15:? AU26$:GOSUB 1240
1010 IF X<12 AND Y=16 THEN XX=9:POSITION 2,16:? AU27$:GOSUB 1240:POSITION 2,16:? AU28$:GOSUB 1240
1020 IF X>11 AND Y=16 THEN XX=34:POSITION 14,16:? AU29$:GOSUB 1240:POSITION 14,16:? AU30$:GOSUB 1240
1030 IF CH=0 THEN POSITION XX,Y:? "   "
1040 IF STRIG(0)=0 THEN GOSUB 1240:GOSUB 1240:GOTO 1120
1050 IF PEEK(764)=255 THEN 980
1060 GET #1,A:CH=CH+1
1070 IF A=155 THEN CH=CH-1:GOTO 1120
```

```
1080 POSITION XX+CH,Y:FIG(CH)=ABS(48-A):? FIG(CH);
1090 IF XX=34 AND CH=2 THEN 1120
1100 IF CH=3 THEN 1120
1110 POKE 764,255:GOTO 980
1120 FIG=FIG(1)*100+FIG(2)*10+FIG(3)
1130 IF CH=2 THEN FIG=FIG(1)*10+FIG(2)
1140 IF CH=1 THEN FIG=FIG(1)
1150 IF FIG>255 OR FIG<1 THEN ? "▮":GOTO 970
1160 IF X>11 AND Y=16 AND FIG>14 THEN ? "▮":GOTO 970
1170 IF X<12 AND Y=15 THEN ATT=FIG
1180 IF X>11 AND X<18 AND Y=15 THEN DEC=FIG
1190 IF X>19 AND Y=15 THEN SUS=FIG
1200 IF X<12 AND Y=16 THEN REL=FIG
1210 IF X>11 AND Y=16 THEN SUSL=FIG
1220 RETURN
1230 REM *** DELAY SUBROUTINE ***
1240 FOR DELAY=1 TO 10:NEXT DELAY:RETURN
1250 REM *** INITIALISATION ***
1260 DIM AU1$(30),AU2$(30),AU3$(30),AU4$(30),AU5$(30)
1270 DIM AU6$(30),AU7$(30),AU8$(30),AU9$(30),AU10$(30)
1280 DIM AU11$(30),AU12$(30),AU13$(30),AU14$(30),AU15$(30),AU16$(30)
1290 DIM AU17$(30),AU18$(30),AU19$(30),AU20$(30),AU21$(30),AU22$(30),AU23$(30),FIG(3)
1300 DIM AU24$(30),AU25$(30),AU26$(30),AU27$(30),AU28$(30),AU29$(30),AU30$(30)
1310 ATT=0:SUS=0:DEC=0:REL=0:SUSL=0:X=0:Y=0:OCT=0:ADSR=0:REP=0:DIS=0
1320 POKE 53768,0:AUD=0:SOUND 0,0,0,0
1330 AU1$="1: 64KHz Main Clock Base"
1340 AU2$="1: 64KHz Main Clock Base"
1350 AU3$="2: 15KHz Main Clock Base"
1360 AU4$="2: 15KHz Main Clock Base"
1370 AU5$="3: High Band Pass Filter"
1380 AU6$="3: High Band Pass Filter"
1390 AU7$="4: 1.79MHz Clock        "
1400 AU8$="4: 1.79MHz Clock        "
1410 AU9$="5: Pure Sound           "
1420 AU10$="5: Pure Sound          "
1430 AU11$="6: Distortion No.1     "
1440 AU12$="6: Distortion No.1     "
1450 AU13$="7: Distortion No.2     "
1460 AU14$="7: Distortion No.2     "
1470 AU15$="8: Distortion No.3     "
1480 AU16$="8: Distortion No.3     "
1490 AU17$="9: 9 Bit Poly-counter  "
1500 AU18$="9: 9 Bit Poly-counter  "
1510 AU19$="10: Repeat             "
1520 AU20$="10: Repeat
"
1530 AU21$="Attack:":AU22$="Attack:"
1540 AU23$="Decay:":AU24$="Decay:"
1550 AU25$="Sustain:":AU26$="Sustain:"
1560 AU27$="Release:":AU28$="Release:"
1570 AU29$="Sustain Level (1-14):":AU30$="Sustain Level (1-14):"
```



```
1580 AUD1=0:AUD2=0:AUD3=0:AUD4=1:AUD5=0:AUD6=0:AUD7=0:AUD8=0:AUD9=0
1590 RETURN
1600 FOR I=0 TO 332:READ A:POKE 39936+I,A:NEXT I
1610 RETURN
1620 DATA 172,31,208,192,5,208,20,104,104,104,104,104,104,104,104,104,104,104,104,104
1630 DATA 104,104,104,104,104,104,96,174,252,2,224,255,240,249,169,0,224,63,208,2
1640 DATA 169,144,224,46,208,2,169,136,224,62,208,2,169,128,224,58,208,2,169,121
1650 DATA 224,40,208,2,169,114,224,56,208,2,169,108,224,45,208,2,169,102,224,61
1660 DATA 208,2,169,96,224,57,208,2,169,91,224,11,208,2,169,85,224,1,208,2
1670 DATA 169,81,224,13,208,2,169,76,224,5,208,2,169,72,224,8,208,2,169,68
1680 DATA 224,0,208,2,169,64,224,2,208,2,169,60,224,14,208,2,169,57,224,6
1690 DATA 208,2,169,53,224,15,208,2,169,50,224,7,208,2,169,47,133,207,141,0
1700 DATA 210,201,0,208,3,76,0,156,104,104,104,133,204,104,104,201,1,208,3,76
1710 DATA 223,156,104,104,104,104,133,205,141,1,210,165,204,201,1,208,15,165,207,201
1720 DATA 0,240,9,106,141,2,210,165,205,141,3,210,104,104,104,104,104,104,104,104
1730 DATA 104,104,96,104,104,201,1,240,5,162,255,142,252,2,104,104,133,208,105,16
1740 DATA 133,209,104,104,133,204,165,208,141,1,210,32,66,157,105,1,197,209,208,244
1750 DATA 104,104,133,204,104,104,133,205,165,209,233,1,141,1,210,32,66,157,233,1
```

Get it right!

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
10	5553	20	8009	30	13332
40	6097	50	1963	60	13916
70	9603	80	4191	90	7104
100	7493	110	6497	120	1908
130	1046	140	6585	150	1614
160	14787	170	5150	180	16723
190	17162	200	17042	210	1272
220	1911	230	4523	240	1908
250	1921	260	5662	270	4191
280	7867	290	6915	300	9464
310	3047	320	3043	330	3008
340	2998	350	5972	360	1631
370	3810	380	3788	390	3797
400	3811	410	3825	420	3829
430	3883	440	3888	450	4002
460	4011	470	4020	480	6399
490	11063	500	15989	510	12306
520	16582	530	11432	540	7424
550	9434	560	8150	570	1498
580	6653	590	17010	600	17012
610	11008	620	11015	630	11028
640	11035	650	20219	660	9193
670	9076	680	9089	690	9656
700	9673	710	11262	720	11262
730	13124	740	13144	750	9859
760	9052	770	8171	780	1498
790	2852	800	5897	810	4530
820	4630	830	4648	840	4713
850	4114	860	4129	870	3977
880	4139	890	4813	900	3881
910	4844	920	5021	930	13781
940	11160	950	1633	960	6102
970	8748	980	17031	990	19377
1000	17668	1010	17064	1020	17664
1030	6387	1040	9158	1050	4386
1060	2855	1070	5381	1080	8486
1090	4577	1100	2856	1110	3757
1120	5117	1130	5764	1140	4167
1150	8098	1160	8883	1170	5699
1180	7136	1190	5798	1200	5686
1210	5848	1220	1498	1230	5236
1240	7309	1250	4789	1260	7555
1270	7870	1280	9263	1290	11840
1300	10783	1310	12647	1320	5686
1330	7119	1340	16467	1350	7188
1360	16475	1370	6794	1380	16142
1390	5131	1400	11279	1410	5381
1420	10916	1430	6488	1440	13533
1450	6502	1460	13548	1470	6518
1480	13563	1490	6999	1500	15196
1510	5015	1520	9106	1530	9372
1540	8397	1550	10266	1560	10032
1570	21261	1580	11686	1590	1498
1600	7919	1610	1498	1620	11941
1630	11461	1640	11507	1650	11289
1660	10726	1670	10651	1680	10444
1690	10725	1700	10769	1710	11956
1720	11342	1730	11385	1740	11771
1750	11411	1760	12104	1770	11460
1780	10079				

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1760 DATA 197,205,208,244,104,104,133,204,169,15,32,66,157,233,1,208,249,165,208,233
1770 DATA 1,133,208,104,104,133,204,165,205,141,1,210,32,66,157,233,1,197,208,208
1780 DATA 244,96,164,204,162,50,202,208,253,136,208,248,96,0,0,0,0,0,0,0
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Have fun with the Nurds

WHIRLINURDS is one of the latest releases from US Gold, who have a reputation for quality Atari software. This is no exception.

The plot behind the game is that the four Nurd brothers have run out of food and decide to raid their friend's house, a greengrocer called Squelch.

He is on holiday and has boobytrapped his house and the Nurds have to avoid the traps and eat all the food.

Whirlinurds is basically a game of exploring rooms, avoiding traps and getting prizes. It may sound all too familiar but is in fact significantly different from other such games.

It is for one to four players who can work individually or as teams.

It consists of 50 rooms, each with a different set of problems or traps. You can start at the beginning of any block of 10 rooms by selecting A-E at the start.

However the last 10 rooms are known as the Ultimate Feast and can only be entered by means of a password. This is gleaned in four parts by completing each of the previous groups of 10 rooms and is not easy.

Each room covers an area equivalent to about six screens, and the area shown on the screen scrolls very smoothly as you approach the edge.

You can imagine 50 rooms like this mean that the game is big and will not be exhausted quickly.

Your man is a Nurd, a squat plump figure with a stupid grin and a propeller stuck out of his head.

The four players are known respectively as Haymish Pupkin, Naples Yertz, Hooseby Nurd and Melvin Lugby. They are identical apart from the colour of their shirts.

The control of your Nurd is quite novel. When walking it is standard – he will walk left when the joystick is pushed left and right when the joystick is pushed right. However



when the trigger is pressed the propeller starts to rotate and your Nurd will begin to rise.

If you release the trigger or if he hits a wall or platform he will begin to descend slowly and will not rise again until he has had his feet on firm ground.

He does have an emergency super leap which can be obtained by pushing the stick up. This is called a retro boost.

You get only one leap per screen or life and here lies a small problem.

It is far too easy to accidentally use this leap in the excitement of play and jump straight into disaster or at the least be deprived of it for later use.

Your man is manoeuvred around the room collecting food. Strange creatures, Nurds – they eat anything from pizzas to light bulbs and bicycles.

The walls, platforms and floors are safe to land on or bump into, but anything flashing is deadly.

These hazards are exotically named and include slinky snakes, bug eyes, jump bugs, globs, spudniks and the Nipple of Death.

In addition there are keys which can be used to unlock closed off areas of the rooms, but beware – they can also unleash further hazards. Small boxes on the floor known as blast squares will give you the same effect as a super leap, but also use up your ability to perform these at will.

The graphics are very good, if not spectacular especially the Nurds. They turn slowly in a 3D effect on changing direction.

The sound effects are also good and add considerably to the feel of the game.

The background music especially adds to the excitement. As the time limit for each room runs out the music gradually quickens, instilling a sense of urgency in your play.

There is also a second level in which the rooms are invisible, except for the flashing obstacles. The Nurd has a torch illuminating only a small area around him.

Whirlinurds is certainly well worth the price of £9.95, or £12.95 on disc. It is novel and has a definite goal to achieve which I feel always keeps a game's interest alive.

I certainly don't think I'll tire of this quickly.

Some of the rooms are extremely difficult and will keep even the most experienced player occupied.

Mike Rowe

Living dangerously in the city

YOU don't come across many fantasy role-playing games for home computers, and I don't class adventures as being in that category, so when one appears on the scene it's well worth taking a closer look at.

Alternate Reality is such a game and is the best of its kind I've seen. It has excellent graphics, bags of action and options and uses music to good effect.

You've been kidnapped by aliens and dumped in a room with only one exit. At the start you are presented with a view of the exit gate through which the impressive city of Xebec's Demise can be seen.

Search me who Xebec was, but since he's described as deceased you can draw your own conclusions about the city's safety.

Near the gate, which is itself barred by a force field, are a collection of revolving numbers. These relate to your individual characteristics – strength, intelligence, stamina, charm, wealth, wisdom, skill and hit points.

As you pass through the gate the numbers freeze and those values then determine your character's attributes. The higher the numbers, the better your chances.

The aim is to explore the city, increase the value of your attributes and above all survive.

During the first few days (game time) you are very

→

vulnerable to foul play so must take care to build up your qualities gradually.

Details of your status can be called up by pressing the Select key at any time. Movement through the maze-like city is controlled by joystick or keyboard.

All other commands, mostly single characters, are entered through the keyboard.

Your current position in the city is shown in the top half of the screen, the lower portion being reserved for commands, options and other text.

Much of the city consists of walled avenues. Closer inspection of any wall may reveal the entrance to a building or even a secret passage.

When you enter a building the screen changes to show a hi-res picture, often animated, of the building's inhabitants and interior.

There are many buildings in the city. Some are for your rest and recuperation. Inns offer lodgings and give time and date information.

Taverns, whose menus change hourly, sell food and drink. Alcohol, as you'd expect, should be taken in moderation. Get drunk and your movements will be inhibited – you may even black out.

Smithies, easily detected by the sound of an anvil being struck, provide weapons. Prices and quality may vary and you'll almost certainly need to haggle.

You can earn interest on your money by leaving it in a bank and can exchange gems for cash. Shops sell a variety of clothes and goods, mostly ornamental. If you become ill or wounded visit a healer.

Weapons can be magical (special or cursed) or just normal, and can be found or purchased. If you want to rid yourself of a cursed weapon try a Guild.

There are many life forms in the city. Guards, gladiators, merchants, dwarves, mages, assassins and imps are just a few. All have their own specialities.

The worst is reported to be the legendary Night Stalker, an extremely powerful creature of the night.

Encounters are common and take one of five forms – you surprise a life form, it surprises you, you see each other at the same time, it sees you first or you see it first.



At an encounter you are either engaged or disengaged. Engaged means you do battle and options include lunge, attack, parry and sneak attack.

If disengaged you may try less violent means – charm or trick an opponent, for example. The use of magic cannot be ruled out either.

Other hazards include being poisoned from a variety of sources – like being clawed by a poisonous creature, and catching a disease – such as contact with bacterial spores of mold.

Potions can be acquired and take four forms: benign, advantageous, disadvantageous and dangerous. Each can be opened, examined for colour, sipped and used. All text is presented in olde English type script and musical effects are used throughout the game. Both add to the atmosphere while the latter can hold clues – the songs played in the taverns often provide important hints.

The city is intended to be just the first in a linked series, and since you can save and later reload your character, this means you can retain any character for use in later releases. Future additions include the dungeon, wilderness, arena and palace.

The game plays a bit slowly, mainly because it has to make so many accesses to the disc during play (the program and data is spread across four sides of two discs).

That apart, it is very enjoyable. The atmospheric detail and presentation, the wide variety of content and the planned expansion route make Alternate Reality an excellent buy at £19.95.

Bob Chappell

Spellbreaker's something

ONCE upon a time when I was but a mere apprentice necromancer to whom the word grue meant nothing, I had the good fortune to thrash the evil warlock Krill.

He was an ambitious wizard, aspiring somewhat immodestly to rule the world. I managed to frustrate his little game, my inexperience succeeding where others more learned had failed.

For my efforts I was admitted to the famed Circle of Enchanters and regarded as second only to the great Belboz.

Then Belboz himself landed in the newt soup and I had my work cut out trying to rescue him from the clutches of the odious Jeearr. That's how I came to be where I am today, top dog of the Circle of Enchanters.

Having thus completed those two superb Infocom adventures **Enchanter** and **Sorcerer** (rated as standard and advanced level), it was with anticipated pleasure and a touch of smugness that I took delivery of the third in the Enchanter trilogy, **Spellbreaker.**

Those obliging people at Software Express waved their magic wand and sent a review copy of Spellbreaker winging towards me as soon as it arrived in the UK.

Removing the usual glossy and handsome box from the sturdy packaging my eyes fell on two words which gave the old ego pause for thought – Expert level.

Spellbreaker begins in the council chamber of Borphee where the Guildmasters are up in arms. You stand at the edge of the gathering, listening to the complaints.

Sneffle the baker moans that he now has to make his butter pasties by hand. His usual method of casting a Gloth spell to fold the pastry 83 times is no longer reliable.

Hoobly the brewer grumbles that his spells are not working either and as a result he's getting cherry flavoured liquid from his vats and the beer tastes like grues have been bathing in it.

Gzornplatz the huntsman says wild animals are over-running the town. The Fripple spell no longer keeps the animals outside the boundaries and only recently one of his men was attacked by a troop of rat ants.

The Guild think the Circle of Enchanters have a lot to answer for and many eyes turn contemptuously on you.

Ardis the poet starts to speak about magic rhyming and spelling aids when, in the midst of his splendid peroration, just as he's sketching out a mythological skit in iambic hexameter, he turns green (well, greener than usual). His chain elongates, his skin slimes up and he promptly turns into a newt.

He's not alone – all the Guild have turned into frogs, salamanders or other amphib-

The ST deserves better graphics

LANDS of Havoc was one of the first graphics games out for the ST. Not surprising though, as it is a translation of a program for the Sinclair QL which uses a cut down version of the 68000 microprocessor in your ST.

This is a graphics adventure game boasting over 2000 screens. The theme is laid out in a small, attractively printed booklet.

The land of Haven, which was cared for by a benign magician, High Vanish, has been turned into an evil land, Havoc, by the Dark Lords.

You play the role of Sador, half man – half reptile and have to find your way around Havoc following clues and instructions left by the magician. The program is well packaged in a sturdy box which also contains nine colour maps.

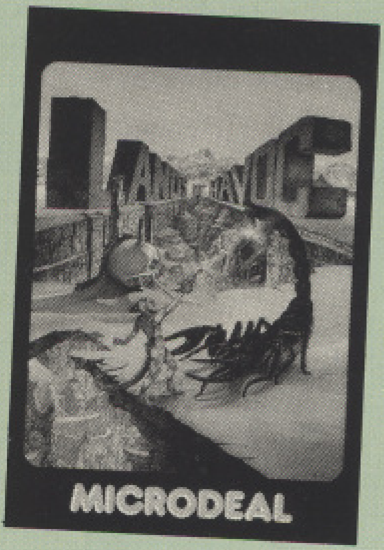
The game starts by setting out the nine areas these maps cover in a random pattern and you lay out the maps in the same pattern.

Each map covers nine screens giving a total of 81 screens to explore in the opening section.

The screens are similar, consisting of passages and junctions separated by walls.

The walls in each screen are always made up by the same blocks of graphics characters in one colour only.

However they vary from screen to screen and are effectively detailed. The pass-



ages are colonised by various creatures including scorpions and ghosts who try to attack you, sapping your energy on contact.

You have a gun but can only fire horizontally. The creatures move smoothly and are vividly animated but unfortunately Sador flickers badly. In this part of the game you must find the entrance to the following part by collecting or touching various items in a specific order.

Instructions are given as you go along after finding the first item, the Book of Change, which is the most difficult to spot.

As you find objects the creatures chasing you get faster and more deadly.

After the first 81 screens are completed you are transported to the underground caverns, the Lair of the Trolls.

The graphics and game is similar except that the walls are all in one colour.

Here you must collect five tokens and then touch the portal to the next section.

By now the creatures are even faster and are difficult to avoid.

The maze of corridors is challenging, as you can often see where you want to be but may have to traverse many rooms in a round-about fashion to get there. I suggest you make a map as you go along.

On completing this task you enter the Keep of The Dark Lords. This is similar to the last section except more difficult still.

You are told that here you must destroy the Lords by touching all nine of them in turn – your gun has no effect on them.

This is as far as I have been able to reach. The game is obviously considerably larger because when killed off I was told that I had only completed 8.5 per cent of the adventure, even at this stage.

Overall the program is somewhat disappointing considering the capabilities of the ST. Graphics are mediocre, sound consists of occasional hisses although the music is good. The flickering is not really good enough.

On the plus side the plot is good, and it is quite playable, but with little variety.

At £19.95 it is good value.

Having said the game was a slight let down, I did have the urge for one more go to get further on – this is often the sign of a game with lasting appeal.

Mike Rowe

of a spellbinder

ians. All except you – and one other, a shadowy figure in a dark cloak who slips out of the door. You pursue him to the town square where he disappears, engulfed in a cloud of orange smoke, leaving behind (once the amber fog has dispersed) nothing but a featureless white cube.

And so the battle of good against evil begins. Magic is going awry. It is your task to get to the root of this paralysing blight that threatens to destroy the kingdom.

Your journey will take you to strange places where you'll meet even stranger beings.

Among the earlier curiosities you'll encounter is a tail-swallowing serpent whose mammoth body forms a huge loop through three tunnels of a cave.

Another is a beautifully described mountain ogre. He has brilliant purple carbuncles and hair matted down with something slick and pungent.

Watch out for a roc the size of an elephant whose hatching egg is itself as big as a small wagon.

As well as a knife and magic burin (engraving tool), you also start out with your indispensable book of re-usable spells.

Other spells can be added to the book by finding spell scrolls, of which there are many scattered around the kingdom, and then writing them into the book by using the special Gnusto spell.

Some spell scrolls are too powerful to be written in the book. These spells can be used directly from the scroll but will only work once.

If you've played Enchanter or Sorcerer you'll be familiar with casting such spells as Yomin (mind probe), Rezrov (open a locked or enchanted object), Frotz (give light from an object) and Malyon (animate).

There are plenty of new ones here – how about Caskly, Throsk and Girgol.

This is Infocom's 18th adventure and the standard remains as high as ever – just how many companies can you recall that have produced almost a score of first-rate pieces of software in a row?

They've even added a new command to their already sophisticated parser.

If you type in a sentence with one word wrong, for example "Put the silver cubw in the green box" you can correct yourself simply by making your next command OOPS word (Oops cube). This saves you typing in a long sentence all over again.

A gripping story, huge vocabulary – over 900 words – vivid descriptive prose, tantalising puzzles and delightful humour. In a word, Spellbreaker.

Don't hang about – Rezrov your cashbox, Malyon those legs down to the nearest phone and order Spellbreaker from Software Express or your local dealer now.

Bob Chappell

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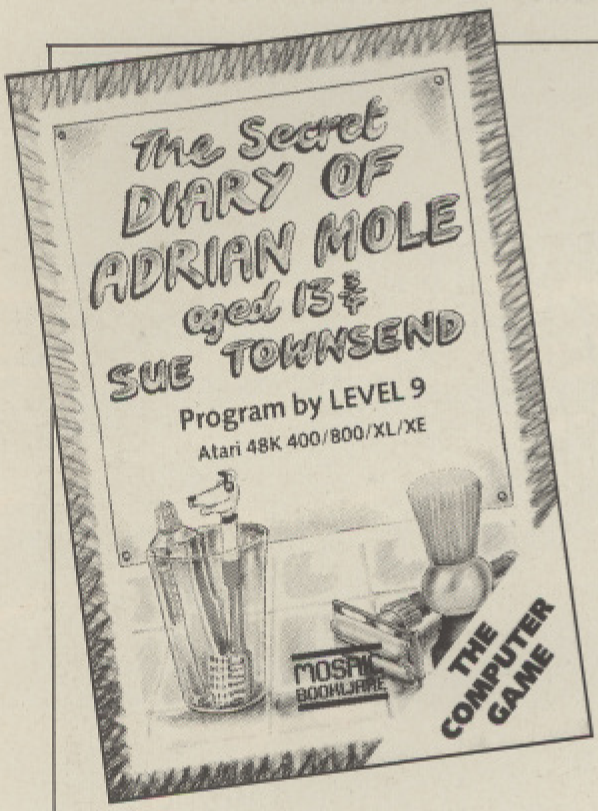
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The Mole with a personality crisis?

By Brillig

THE Adrian Mole industry that has grown up around the Sue Townsend books was certain to spawn a computer game.

The Secret Diary of Adrian Mole arrived from Mosaic Publishing on tape for the Atari 48k range with a dogs head toothbrush and shaving kit depicted on the cover, accompanying the rather more impressive credentials of Level 9 as the programmers.

The blurb to the game is predictably in Mole-ese, something I will try to avoid. It comes in four parts and you have to assist Adrian in his quest to become more popular. Alternatively, as the game suggests, you could try to become as unpopular as possible.

Each chunk of game covers three months of the unfortunate Mole's life. You are presented with a scrolling diary in the normal Level 9 text fashion, below the now obligatory graphics.

Occasionally you are asked to select a course of action for Adrian to follow from the three or four provided. Sometimes you are given a percentage score and a comment as to your status.

And that is about all that does happen. It is a shame that such a good idea has been wasted.

The text is excellent not only, as you would expect from the best selling books, but also from the extra text added by Pete Austin.

But the graphic screen at the top adds nothing to the atmosphere of the game, and yet its very existence results in the increased requirement of the "Press any key to continue" prompt which dogged my progress throughout.

The scoring routine adds little either, firstly because the remarks are rather wearing once into the second half of the year, and secondly because as it appears as a prompt during the diary you can not see how your actions are affecting the score.

I must stress that at times the game did make me laugh at the antics of Master Mole. The beauty of the books, however, was that the themes were developed throughout, with notable hilarious incidents woven around them. In the game the themes such as Mrs Mole leaving home and the red socks episode become small incidents that suddenly happen. The

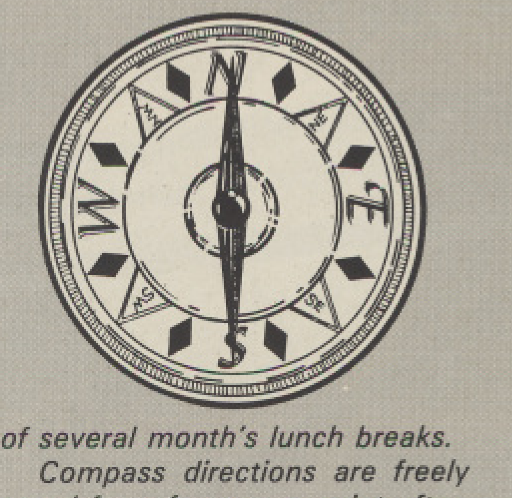
Help!

I've had some appeals for help.

Craig Fippard offers his maps of Voodoo Castle, Zork I, Colossal Adventure and Feasibility Experiment. Quite a mixed bunch there and although we offer no prizes for such contributions, they are most welcome. Craig is trying to repair the lantern in Feasibility Experiment and wonders whether anyone else can help him.

S. Goring has gone one better and sent his map of Colossal. However, this does not include the 70 location end game of Level 9 as it was taken from a DEC mainframe.

The map is detailed and well drawn – obviously the culmination



of several month's lunch breaks.

Compass directions are freely noted for reference, a point often neglected by adventurers when they play but regretted when they return to the game several weeks later.

Dawn Ward would like some hints on Mordon's Quest. I did not know it was available on the Atari, but diligent research has discovered you need to drop the blanket to prevent that sinking feeling, a gallic kind of sacrifice is called for to get through the waterfall and there is a place where you can fill the aqualung to stop drowning.



books were in the first person and succeeded because everyone who read them identified with and, to an extent, became Adrian Mole.

The game is purely an exercise in route finding through a series of set pieces, and the player becomes essentially a reader, without the benefit of real involvement.

Often just as I was getting into a route which appeared to be entertaining, up would come a screen full of text and the game would change direction once again.

I think this is a great shame. We saw what can happen to a comedy classic in Hitchhiker's Guide to the Galaxy. The Secret Diary of Adrian Mole had the same potential. Unfortunately it seems to be left peering contemplatively at itself in the bathroom mirror.

● *Next month I hope to review a load of new adventures released at the Atari Show, as well as seeing what is new and exciting in the world of Atari.*

Glitches of the Month:

Glitch of the Month brings two similar problems in different Level 9 games.

As in Mordon's Quest breathing underwater features in both Red Moon and Adventure Quest. In the latter S. Watson points out that if you enter the river with nothing, go to the shelf, get the fish, enable your breathing and return to the river you no longer need go through the process of getting and dropping the fish to be able to breath in different environments.

S. Calkin has found in Red Moon that once you have the pipes and helmet you can wander for miles underwater without ever having to fix the pipes or worry about them being too short.

Thank you folks, your T shirts are in the post. Not so the T shirt for Geoffrey McHugh, who supplied our December Glitch. Sorry but we've lost your address in the editorial maze. If you contact the office all can be resolved.

BASIC COMPILER

Part Two of the series by FRANK O'DWYER that helps you speed up your programs

HERE is the second part of the Basic compiler program – the compiler library. You should type it in using the Atari assembler/editor cartridge or compatible assembler, and save it on a cassette by itself.

This cassette, and the one containing the compiler program given last month, will be required every time you compile a program.

You don't really know enough about the compiler to begin to write and compile your own programs yet, so for now let's try to compile the Basic program given as Program II.

This is simply a demonstration program – don't worry about how it works for now. It produces random sounds and patterns until a key is pressed. An equivalent program, written in Atari Basic, is given as Program III. You can type this in to compare the speed of Atari Basic with Compiler Basic.

Compilation is essentially a three stage process. First you create your program – this is called editing. Then comes compilation, where the program is translated from Basic into Assembly language. Finally comes assembly and execution. Here you assemble the program and run it. If at any stage you make a mistake you must go back to stage one.

Let's go through the three stages with the example, Program II.

● Editing

For this you will need a text editor. If you are using the Atari assembler cartridge this is no problem since one is included in the cartridge. If using some other assembler program then you can probably use its text editor for this purpose. If not you will have to beg, borrow or steal a text editor from somewhere.

Type in your program using the text editor – the NUM command of the Atari assembler/editor cartridge can be used to supply automatic line numbering. Type in Program II in this way, making sure you have the assembler cartridge plugged in since Atari Basic will reject Compiler Basic with syntax errors.

Type in the program as given. Note that the compiler does not recognise abbreviations such as POS. for POSITION and ? for PRINT. When sure you have typed the program correctly save it on its own cassette.

Use the LIST#C command of the assembler cartridge. This saves the program in Ascii character form on the cassette and is the only form the compiler will recognise – so if you are using an assembler other than the Atari version you must use an equivalent command. The cassette you have just made will now be referred to as the source program or source file.

● Compiling

Plug in the Basic cartridge and load the compiler program given last month. Now insert the cassette containing the source program. Don't forget to rewind the tape. RUN the compiler which will prompt you for the source file name. The correct response is C: for cassette. Press Play on the cassette drive, and Return on the computer as if you were loading a program.

You should see Program II being listed out on the screen and the compiler will prompt you for the start address of the Assembly language. The answer to this is really up to you, but I suggest 14336 for this example which is the address of the last 2k on a 16k Atari.

Now you will be prompted for the start line number for the Assembly language – almost any number greater than 1000 will do here, so just enter 1000 for now. Almost invariably you will enter 1000 in response to this question – other responses are only required if you want to have more than one compiled program share the same compiler library, and this is a topic which I will return to in a later article.

The next question to answer is the Filename for the Assembly language. Assuming you are using cassette, the correct answer is C:. Before you respond you should insert a cassette ready to take the program which the compiler is about to generate. Press Play and Record on the cassette, then Return when you hear the two beeps.

The compiler will display each line number as it is compiled, and will finish by telling you how many errors it discovered in your program. If there were none you can proceed to the next step. If there were errors then you must go back to stage one.

● Assembly

Insert the assembler cartridge and rewind the cassette you have just made. Type ENTER#C to load the

Assembly language. Now insert the cassette with the compiler Library on it, and merge it with what you have already using ENTER#C,M.

If all has gone well you now have one large assembly language program equivalent to the Basic program you originally entered. You must assemble this program and since it is likely to be large, you should do so directly to cassette using ASM,,#C. This produces yet another cassette file.

Before telling you how to execute your program, I must draw your attention to a problem with the ASM,,#C command in the Atari cartridge. It falls down badly when files are long.

Since the assembler is quite slow in this circumstance a long leader is formed on the tape if the cartridge is left to its own devices (the leader is the tone you hear prior to a tape file being loaded or saved).

Press Pause on the tape drive, and Ctrl-1 on the computer which freezes the listing.

After a minute or two the cursor disappears, and you disengage the Pause on the tape drive, and press Ctrl-1 so that the listing begins to appear on the screen. You can now leave the computer to get on with the assembly. Any errors mean that you must go back to the first step.

After the assembly process you are left with a cassette containing the machine code bytes for your program. Typically this extends for 2k of machine language and so I recommend 14336 as the start address of the Assembly language.

Once you have chosen this address you are stuck with it and you must poke the bytes for the machine language to this location in memory since it will not run properly if it is placed anywhere else in memory – it is what is known as position-dependent code or non-relocatable code.

The problem you are faced with now is how to get the bytes from the cassette into memory. Below is a short Atari Basic program which will do the trick (Program IV).

To use this routine insert the cassette with the machine language and press Play on the tape drive. Run the program, and press Return when you hear the beep. Let the program run until it comes up with Error 136. This means, somewhat perversely, that the program was successfully loaded.

Do not press System Reset since this will wipe the machine language program from memory.

To invoke the machine language type X=USR(14336) in the case of the example, Program II. You should now hear random sound and see random patterns on a Graphics 3 screen. When you are tired of this, press any key, and you will be returned to Basic. You can return to the machine language any time – provided you don't reset the machine – by typing X=USR(14336).

● *That's how to use the compiler. Next month I will discuss the features of the Compiler language and begin to explain how you can write your own programs in Compiler Basic.*

```
1000 REM COMPILER DEMO
1010 CLOSE #6:OPEN #6,12,3,"S:":REM GRAPHICS 3+16
1020 S=88#:POKE 764,255:REM CLEAR ANY KEYPRESS
1030 F=53770#?200:REM RANDOM NUMBER BETWEEN 0 AND 199
1040 POKE S+F,53770#:REM POKE RANDOM BYTE TO SCREEN DISPLAY
1050 ZERO R:FOR R TO 3:REM CYCLE THROUGH SOUND CHANNELS
1060 SOUND R,53770#,10,8:REM RANDOM PITCH
1070 NEXT R
1080 IF 764#=255 THEN GOTO 1030 ENDIF:REM LOOP BACK IF NO KEY PRESSED
1090 ZERO R:FOR R TO 3:REM SILENCE SOUND CHANNELS
1100 SOUND R,0,0,0
1110 NEXT R
1120 BASIC
```

Program II: Compiler demo program

```
1010 CLOSE #6:OPEN #6,12,3,"S:":REM OR
 SIMPLY GRAPHICS 3+16
1020 S=PEEK(88)+256*PEEK(89):POKE 764,
255
1030 F=INT(RND(0)*200)
1040 POKE S+F,PEEK(53770)
1050 FOR R=0 TO 3
1060 SOUND R,PEEK(53770),10,8
1070 NEXT R
1080 IF PEEK(764)=255 THEN GOTO 1030
1090 FOR R=0 TO 3
1100 SOUND R,0,0,0
1110 NEXT R
1120 END
```

Program III: Equivalent Atari Basic to Program II

```
10 CLOSE #1: OPEN #1,4,0,"C:"
20 FOR N=1 TO 6:GET #1,C:NEXT N
30 POKE 106,48: GRAPHICS 0: REM RESERVE SOME
   MEMORY FOR PROGRAM
40 FOR A=14336 TO 16384: GET #1,C: POKE A,C: NEXT A
```

Program IV: Putting the bytes into memory

Listing overleaf

Program I

```
02 EOUTCH=$F6A4
03 COM=$342
04 BUF=$344
05 BUFL=$348
06 AUX1=$34A
07 AUX2=$34B
08 CIO=$E456
09 STACK=$600
10 GET=$F6E2
11 R1=$D4
12 R2=$D6
13 A1=$CB
14 A2=$CD
15 A3=$CF
16 TMP=$D8
17 SP=$D1
18 A45=MIN
19 A63=MO
20 A43=PLUS
21 A42=MULT
22 A47=DI
23 A35=PEEK
24 A64=DEEK
25 A60=LT
26 A62=GT
27 A61=EQ
28 A38=AND
29 A94=XOR
30 A124=OR
31  JMP MAIN
32 INIT PLA
33  STA R1
34  PLA
35  STA R2
36  LDX #0
37  PLA
38  TAY
39  CLD
40  STA V,X
41  TXA
42  STA V+1,X
43  CPY #0
44  BEQ EX
45 LL INX
46  INX
47  INX
48  INX
49  PLA
50  STA V+1,X
51  PLA
52  STA V,X
53  DEY
54  BNE LL
55 EX TSX
56  STX SP
57  LDA R2
58  PHA
59  LDA R1
60  PHA
61  RTS
62 V .BYTE "A...B...C...
   D...E...F...G...H...I...
   J...K...L...M...N...O...
   P...Q...R..."
63 SVA .BYTE "S...T...
   U...V...W...X...Y...Z..."
64 TMP1 .WORD 0
65 PTR .WORD 0
66 BASIC LDX SP
67  TXS
68  RTS
69 EQ STA R2
70  STX R2+1
71  LDA R1
72  CMP R2
73  BNE FALSE
74  LDA R1+1
75  CMP R2+1
76  BNE FALSE
77 TRUE LDA #1
78 TR1 LDX #0
79  STX R1+1
80  STA R1
81  RTS
82 FALSE TYA
83  BEQ TR1
84 NE JSR EQ
85  JMP NOT
86 LT STA R2
87  STX R2+1
88  LDA R1+1
89  CMP R2+1
90  BEQ TLO1
91  BCS FALSE
92  BCC TRUE
93 TLO1 LDA R1
94  CMP R2
95  BCS FALSE
96  BCC TRUE
97 LE JSR GT
98  JMP NOT
99 GT STA R2
0100  STX R2+1
0101  LDA R1+1
0102  CMP R2+1
0103  BEQ TLO
0104  BCS TRUE
0105  BCC FALSE
0106 TLO LDA R1
0107  CMP R2
0108  BEQ FALSE
0109  BCC FALSE
0110  BCS TRUE
0111 GE JSR LT
0112 NOT JSR IF
0113  BNE FALSE
0114  BEQ TRUE
0115 IF LDA R1
0116  ORA R1+1
0117  RTS
0118 XOR STA R2
0119  STX R2+1
0120  LDA R1
0121  EOR R2
0122  STA R1
0123  LDA R1+1
0124  EOR R2+1
0125  STA R1+1
0126  RTS
0127 AND STA R2
0128  STX R2+1
0129  LDA R1
0130  AND R2
0131  STA R1
0132  LDA R1+1
0133  AND R2+1
0134  STA R1+1
0135  RTS
0136 OR STA R2
0137  STX R2+1
0138  LDA R1
0139  ORA R2
0140  STA R1
0141  LDA R1+1
0142  ORA R2+1
0143  STA R1+1
0144  RTS
0145 PLUS STA R2
0146  STX R2+1
0147  CLC
0148  LDA R1
0149  ADC R2
0150  STA R1
0151  LDA R1+1
0152  ADC R2+1
0153  STA R1+1
0154  RTS
0155 MIN STA R2
0156  STX R2+1
0157  SEC
0158  LDA R1
0159  SBC R2
0160  STA R1
0161  LDA R1+1
0162  SBC R2+1
0163  STA R1+1
0164  RTS
0165 MULT STA R2
0166  STX R2+1
0167  TYA
0168  STA TMP
0169  STA TMP+1
0170  LDX #16
0171 M1 LSR R2+1
0172  ROR R2
0173  BCC M2
0174  CLC
0175  LDA R1
0176  ADC TMP
0177  STA TMP
0178  LDA R1+1
0179  ADC TMP+1
0180  STA TMP+1
0181 M2 ASL R1
0182  ROL R1+1
0183  DEX
0184  BNE M1
0185  LDA TMP
0186  STA R1
0187  LDA TMP+1
0188  STA R1+1
0189  RTS
0190 DIV STA R2
0191  STX R2+1
0192  TYA
0193  STA TMP
0194  STA TMP+1
0195  STA TMP1+1
0196  LDA #1
0197  STA TMP1
0198  LDA R2+1
0199  ORA R2
0200  BEQ RE
0201 JUST LDA R2+1
0202  AND #$80
0203  BNE DV0
0204  ASL R2
0205  ROL R2+1
0206  ASL TMP1
0207  ROL TMP1+1
0208  BCC JUST
0209 DV0 LDA R1+1
0210  CMP R2+1
0211  BEQ LO
0212  BCS DV1
0213  BCC DV2
0214 LO LDA R1
0215  CMP R2
0216  BEQ DV1
0217  BCC DV2
0218 DV1 LDA R1
0219  SBC R2
0220  STA R1
0221  LDA R1+1
0222  SBC R2+1
0223  STA R1+1
0224  LDA TMP
0225  ORA TMP1
0226  STA TMP
0227  LDA TMP+1
0228  ORA TMP1+1
0229  STA TMP+1
0230 DV2 LSR R2+1
0231  ROR R2
0232  LSR TMP1+1
0233  ROR TMP1
0234  BCC DV0
0235 RE RTS
0236 DI JSR DIV
0237  LDA TMP
0238  STA R1
0239  LDA TMP+1
0240  STA R1+1
0241  RTS
0242 MO JSR DIV
0243  RTS
0244 INC INC V,X
0245  BNE RE
0246  INC V+1,X
0247  RTS
0248 DEC DEC V,X
0249  LDA V,X
0250  CMP #$FF
0251  BNE RE
0252  DEC V+1,X
0253  RTS
0254 SAVE LDX #14
0255  CLD
```

```
0256 SL LDA A1-1,X
0257  STA S-1,X
0258  DEX
0259  BNE SL
0260  LDA TMP1
0261  STA T
0262  LDA TMP1+1
0263  STA T+1
0264  RTS
0265 T .WORD 0
0266 S .BYTE ".1.1.1.1.1.1.1"
0267 EXIT LDX #14
0268 EL LDA S-1,X
0269  STA A1-1,X
0270  DEX
0271  BNE EL
0272  LDA T
0273  STA TMP1
0274  LDA T+1
0275  STA TMP1+1
0276  RTS
0277 PEEK LDA (R1),Y
0278  STA R1
0279  TYA
0280  STA R1+1
0281  RTS
0282 DEEK LDA (R1),Y
0283  TAX
0284  INY
0285  LDA (R1),Y
0286  STA R1+1
0287  STX R1
0288  DEY
0289  RTS
0290 POKE LDA R1
0291  STA (A1),Y
0292  RTS
0293 DOKE LDA R1
0294  STA (A1),Y
0295  LDA R1+1
0296  INY
0297  STA (A1),Y
0298  DEY
0299  RTS
0300 LD1 STA R1
0301  STX R1+1
0302  RTS
0303 LDI LDA V,X
0304  STA R1
0305  LDA V+1,X
0306  STA R1+1
0307  RTS
0308 RESTORE STA PTR
0309  STX PTR+1
0310  RTS
0311 READ LDA PTR
0312  STA TMP
0313  LDA PTR+1
0314  STA TMP+1
0315  LDA (TMP),Y
0316  STA V,X
0317  TYA
0318  STA V+1,X
0319  INC PTR
0320  BNE RET
0321  INC PTR+1
0322 RET RTS
0323 POSITION LDA A1
0324  STA 85
0325  LDA R1
0326  STA 84
0327  RTS
0328 SETCOLOR LDX A2
0329  LDA A1
0330  ASL A
0331  ASL A
0332  ASL A
0333  ASL A
0334  ORA R1
0335  STA 704,X
0336  RTS
0337 SOUND STY 53768
0338  LDA #3
0339  STA 53775
0340  LDA A3
0341  ASL A
0342  TAX
0343  LDA A2
0344  STA 53760,X
0345  LDA A1
0346  ASL A
0347  ASL A
0348  ASL A
0349  ASL A
0350  ORA R1
0351  STA 53761,X
0352  RTS
0353 SPRINT PLA
0354  STA TMP
0355  PLA
0356  STA TMP+1
0357 PL INC TMP
0358  BNE CC
0359  INC TMP+1
0360 CC LDA (TMP),Y
0361  CMP #$FF
0362  BEQ FF
0363  JSR EOUTCH
0364  LDY #0
0365  BEQ PL
0366 FF LDA TMP+1
0367  PHA
0368  LDA TMP
0369  PHA
0370  RTS
0371 ARG LDA R1
0372  STA A1,X
0373  LDA R1+1
0374  STA A1+1,X
0375  RTS
0376 LIM INX
0377  INX
0378 AGN LDA R1
0379  STA V,X
0380  LDA R1+1
0381  STA V+1,X
0382  RTS
0383 LDV LDA V,X
0384  PHA
0385  LDA V+1,X
0386  TAX
0387  PLA
0388  RTS
0389 STP .BYTE 0
0390 PUSH CLC
0391  LDY STP
0392  TYA
0393  ADC #4
0394  STA STP
0395 PSH LDA V,X
0396  STA STACK,Y
0397  INX
0398  INY
0399  BEQ OVR
0400  CPY STP
0401  BNE PSH
0402  LDY #0
0403  RTS
0404 PULL SEC
0405  LDY STP
0406  TYA
0407  SBC #4
0408  STA STP
0409 PLL DEY
0410  CPY #255
0411  BEQ UNDR
0412  LDA STACK,Y
0413  STA V+3,X
0414  DEX
0415  CPY STP
0416  BNE PLL
0417  LDY #0
0418  RTS
0419 UNDR JSR ERR
0420  JSR SPRINT
0421  .BYTE "PULLS",155,255
0422  RTS
0423 OVR JSR ERR
0424  JSR SPRINT
0425  .BYTE "PUSHES",155,255
0426  RTS
0427 ERR LDY #0
0428  JSR SPRINT
0429  .BYTE 253,"STACK ERROR
   - TOO MANY ",255
0430  RTS
0431 BUFS JSR LSHF4A
0432 BFS LDA R1+1
0433  STA BUF+1,X
0434  LDA R1
0435  STA BUF,X
0436  RTS
0437 LSHF4A ASL A
0438  ASL A
0439  ASL A
0440  ASL A
0441  TAX
0442  RTS
0443 OPENC LDA A3
0444  JSR BUFS
0445  LDA #3
0446 H1 STA COM,X
0447  LDA A2
0448  STA AUX1,X
0449  LDA A1
0450  STA AUX2,X
0451 CIOR JSR CIO
0452 STAT STY SVA
0453  TYA
0454  LDY #0
0455  STY SVA+1
0456  TAX
0457  BMI HNDL
0458 IGNR RTS
0459 HNDL LDA TRF
0460  BEQ IGNR
0461  PLA
0462  PLA
0463  JMP (TRAP)
0464 TRAP .WORD 0
0465 TRF .BYTE 0
0466 CLOSEC LDA R1
0467  JSR LSHF4A
0468  LDA #12
0469  BNE H1
0470 PUTC LDA A1
0471  JSR LSHF4A
0472  LDA #11
0473  STA COM,X
0474  TYA
0475  STA BUFL,X
0476  STA BUFL+1,X
0477  LDA R1
0478  JMP CIOR
0479 GETC LDA R1
0480  JSR LSHF4A
0481  LDA #7
0482  STA COM,X
0483  TYA
0484  STA BUFL,X
0485  STA BUFL+1,X
0486  JSR CIO
0487  STA R1
0488  LDA #0
0489  STA R1+1
0490  BEQ STAT
0491 XIO1 LDA A2
0492  JSR LSHF4A
0493  LDA A3
0494  STA COM,X
0495  LDA A1
0496  STA AUX1,X
0497  LDA R1
0498  STA AUX2,X
0499  STX CHN
0500  RTS
0501 XIO2 LDX CHN
0502  JSR BFS
0503  JMP CIOR
0504 CHN .BYTE 0
0505 MAIN
0506  LDY #0
0507  STY STP
0508  STY TRF
```

Note: For presentation purposes, lines 62, 63 and 0429 have been 'wrapped round'. They should be entered as continuous lines.

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A colourful combination

JOHN WHITE demonstrates the way to brighten up your screen display by using Modes 12 and 13

AS the memory of Atari 8 bit computers (successively models 400, 800, 1200, 600XL, 800XL and 130XE) gets larger – it seems that the manual supplied with them gets smaller.

The old 16k Atari 400 computer came with two thick manuals describing the use of the machine. The latest 128k Atari 130XE has only a small instruction booklet which does little beyond revealing the permitted Basic key words.

This is a pity, because some powerful capabilities are hidden within these machines which are not referred to by any of the manuals nor by the beginners' books supplied by other authors.

The experienced Atari user will doubtless be aware that there are three well-documented text modes (in Basic, Modes 0, 1 and 2) and a further six graphics modes (Basic Modes 3, 4, 5, 6, 7 and 8). There are also three GTIA graphics modes (Basic Modes 9, 10 and 11) which can be found in the later models.

The trouble with the text modes which print characters on the screen is that the background colour remains the same for each printed character, even though it is possible to alter the colour of the characters themselves.

For example, you can print the letter A on the screen in four different colours in text Modes 1 and 2, but the background remains the same for each. Any attempt to change the background colour equally alters the background of all the different coloured characters.

Suppose you want to make a chess board. This requires black and white pieces to be placed on, say, blue and red background squares. Clearly text Modes 1 and 2 are not suitable for this purpose.

However a poorly documented solution exists to this problem. The Antic graphics chip is responsible for all the graphics and text modes known in Basic, but also permits a few interesting extra modes.

These were only accessible in the early Atari computers by writing a custom-designed display list – a short machine code routine which called the necessary extra Antic modes. Some of these extra options are now directly available to the Basic programmer who has a 600XL, 800XL or 130XE computer.

Text Modes 12 and 13 in Basic on the latter computers correspond to Antic Modes 4 and 5 respectively from the older Atari machines. They permit text to be printed on to the screen in any combination of four colours per character, with up to five colours available on one screen.

Before going any further it is necessary to examine how the Ataris display characters on the screen. The main difference between the graphics and text modes is that the former display only a single byte of data by POKEing it onto the screen, whereas the latter takes the character code, looks up the corresponding eight consecutive bytes from the character set and POKEs all eight of the data bytes one underneath another on the screen.

A character therefore comprises eight bytes placed vertically on the screen. Each consists of eight bits, each of which may be set, 1, which means that a colour is shown in that pixel, or not set, 0, meaning that the background colour is assumed.

The letter A is the 33rd character in the Atari character set. Figure I shows exactly how the eight data bytes for the letter A are held in memory.

The head of the character set is indexed by memory location 224. Thus the first character in the set has its data bytes stored in memory locations 224*256, 224*256+1, 224*256+2, ..., 224*256+7

Since A is the 33rd character and each character has eight data bytes, we must look for the data for letter A from positions 224*256 + 33*8 to 224*256 + 33*8 + 7.

You can test this statement with program I. The results which are printed out should agree with those displayed in Figure I.

```
10 FOR I=0 TO 7
20 PRINT PEEK(224*256+33*8+I)
30 NEXT I
```

Program I

Now try Programs II and III, watching the screen carefully. Program II puts the letter A on the

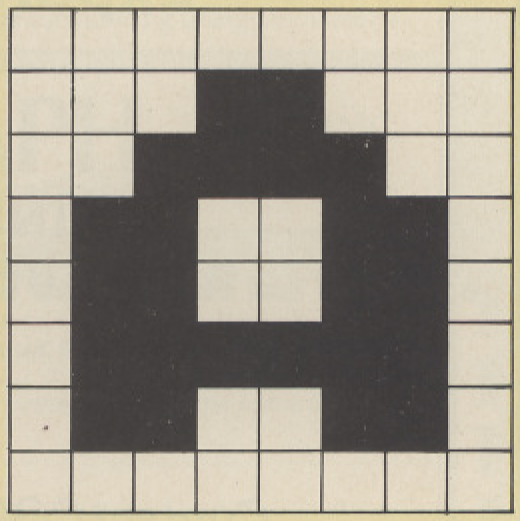


Figure I: Data bytes for letter A

screen in text Mode 0. Program III develops and prints the same letter A in graphics Mode 8 by placing graphics data bytes taken from the character set for the letter A sequentially, one underneath each previous byte.

```
5 REM SCR holds the memory location of
 the top-left corner of the screen
10 GRAPHICS 0:POKE 752,1
20 SCR=PEEK(88)+256*PEEK(89)
30 POKE SCR,33
```

Program II

```
10 GRAPHICS 8
20 SCR=PEEK(88)+256*PEEK(89)
30 FOR I=0 TO 7
40 POKE SCR+40*I,PEEK(224*256+33*8+I)
50 FOR J=1 TO 200:NEXT J:REM DELAY
60 NEXT I
```

Program III

We have seen that the letter A can be poked to the screen with the code 33. On colour text screens (Modes 1 and 2), the sixth and seventh bits of code are combined to show the colour of the character.

Since four combinations are available by changing two bits, four colours can be permitted on the screen. Thus, repeatedly adding the value 64 to the original character code will change the colour up to four times. Try Program IV and see.

```
10 GRAPHICS 1
20 SCR=PEEK(88)+256*PEEK(89)
30 FOR I=0 TO 3
40 POKE SCR+I,33+64*I
50 NEXT I
```

Program IV

Binary	Decimal
00000000 =	0
00011000 =	24
00111100 =	60
01100110 =	102
01100110 =	102
01111110 =	126
01100110 =	102
00000000 =	0

Now return to Program II and change line 10 to read 10 GRAPHICS 12. Run the program. What has happened to the character?

In Modes 12 and 13 the character data bytes are used differently to their role in Mode 0, although a full character of eight bytes is still displayed.

Each different pair of bits in a data byte tells a separate colour register to colour the pixel described by the two bits. Again there are four permutations of two bits – 00, 01, 10 and 11 – so four colours can be permitted in one character byte.

Let's look at letter A again in the light of this information.

00	00	00	00
00	01	10	00
00	11	11	00
01	10	01	10
01	10	01	10
01	11	11	10
01	10	01	10
00	00	00	00

Figure II: Mode 12 character data bytes

Note that the character is now only four pixels wide, whereas it was eight pixels wide in text Modes 0, 1 and 2. If you have colouring pencils handy colour in Figure II with the default Atari colours thus:

00 – black
01 – orange
10 – green
11 – dark blue

Compare the coloured picture with the screen character. They should be similar, although colour bleeding on the screen tends to blur the colours.

Now try changing line 30 in Program II to 30 POKE SCR, 33+128.

One of the colours of the character on the screen has altered. As was the case in text Modes 1 and 2 changing one of the top bits of the character code has affected a colour register, although in text Modes 12 and 13 only the top bit can be altered.

Table I illustrates the effect of the character code and the values of the data bytes on the colour registers used. Use SETCOLOR N to alter the colours, where N is the value of the colour register shown in the table.

Bit Pair	Colour registers affected	
	Character code	code+128
00	4	4
01	0	0
10	1	1
11	2	3

Table I

The colour registers can be changed in the ordinary way from Basic with, for example, SETCOLOR 0,12,6: SETCOLOR 1,14,8 according to whim.

The character set provided by Atari in ROM is designed for use with text Modes 0, 1 and 2, and is rather useless in text Modes 12 and 13.

However if the original character set is copied into RAM, individual characters can be altered to give interesting pictures. A machine code utility for copying the set into RAM is given in the Chess Board program at the end of this article.

There is one important disadvantage with this method of displaying multi-coloured graphic characters on the screen. For each character byte which has been modified there is one less of the original character set to be displayed. It is easy to consume part of the original alphabet stored in the character set so that only garbage will be printed out in the text window.

It is possible to divide a single chess piece into four different characters which are then POKEd on to the screen in this order:

A B
C D

The character data for a chess rook is shown in Figure III. The rook is divided into four characters, each of which has eight associated data bytes. I have drawn the pieces in such a way that each byte is part of a twin pair of identical bytes. This saves space in data statements in the Chess Board program, but higher resolution could be achieved by making each byte of the pair different.

The program places a chess board on the screen in five colours. When you have finished with it alter the GRAPHICS 12 in line 590 to

→

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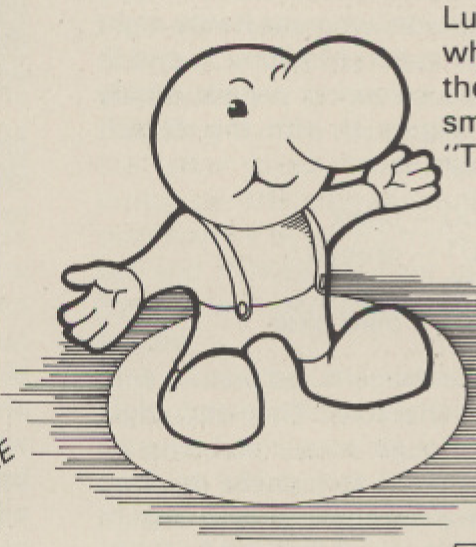
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GRAPHICS 13. Text Mode 13 is much the same as Mode 12, but the board is stretched downwards to double its size.

Using four characters to represent one chess piece exacts a heavy toll from the original character set. There are six types of black pieces, six of white pieces and one type of vacant square, requiring 52 characters of the original 128 to be modified. Try typing into the text window and you will find that most of the lower case characters are missing.

The excellent Chess cartridge from Parker probably uses Mode 12 or Mode 13 for its magnificent, multi-colour graphics. However in accordance with the high penalty paid in the character set for this approach, Parker Chess displays no ordinary text on the screen at all – all moves by the player are entered with a joystick and cursor.

Finally, a warning – save the Chess Board program to cassette or disc before running it for the first time.

								A	B
11	11	11	11	11	11	11	11	$FF = 255	$FF = 255
11	11	11	11	11	11	11	11		
11	01	11	01	11	01	11	11	$DD = 221	$DF = 223
11	01	11	01	11	01	11	11		
11	01	01	01	01	01	11	11	$D5 = 213	$5F = 95
11	01	01	01	01	01	11	11		
11	11	01	01	01	11	11	11	$F5 = 245	$7F = 127
11	11	01	01	01	11	11	11		
11	11	01	01	01	11	11	11	$F5 = 245	$7F = 127
11	11	01	01	01	11	11	11		
11	01	01	01	01	01	11	11	$D5 = 213	$5F = 95
11	01	01	01	01	01	11	11		
11	01	01	01	01	01	11	11	$D5 = 213	$5F = 95
11	01	01	01	01	01	11	11		
11	11	11	11	11	11	11	11	$FF = 255	$FF = 255
11	11	11	11	11	11	11	11		
								C	D

Figure III: Data bytes for a chess rook

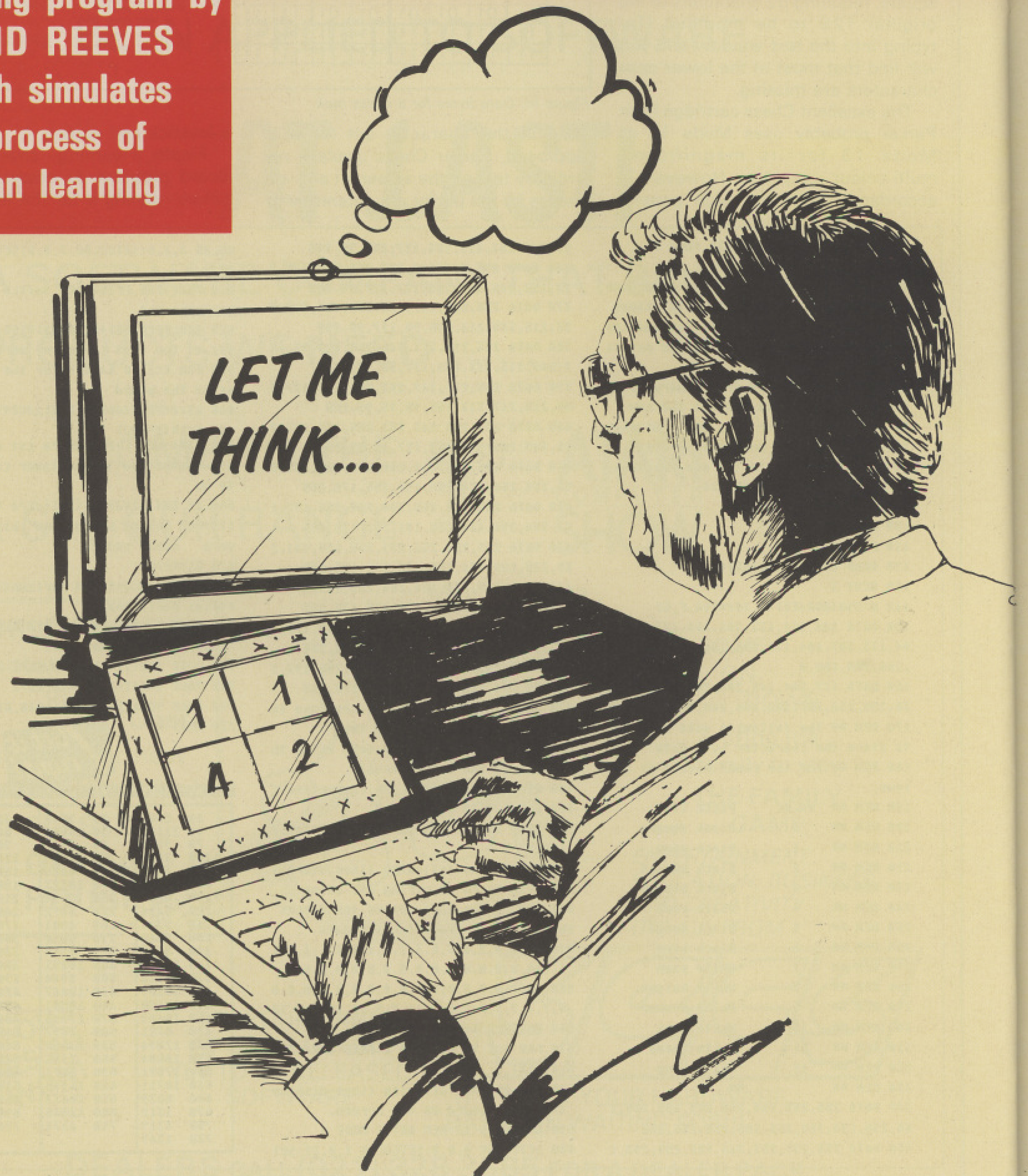
```
10 REM CHESS BOARD (ANTIC MODE 4)
20 DIM E$(37),A$(65)
30 REM ** Lines 80 - 160 use a machine-code routine to transfer 4 (G) pages
40 REM ** of the Character Set and copy it into RAM 4 pages below the existing set.
50 REM ** The top of free memory is moved down 4 pages to protect the new
60 REM ** Character Set, and a Graphics call is made to move the screen
70 REM ** display to the new position.
80 F=(PEEK(106)-4)*256:G=4
90 POKE 106,PEEK(106)-4
100 GRAPHICS 0
110 FOR I=1 TO 36
120 READ A:POKE ADR(E$)+I,A
130 NEXT I
140 Q=USR(ADR(E$)+1,224*256,F,G)
150 DATA 104,104,133,205,104,133,204,104,133,207,104,133,206,104,104,133,208,166,208,160,0
160 DATA 177,204,145,206,200,208,249,230,205,230,207,202,208,240,96
170 REM ** The following data statements store the character byte data
180 REM ** for the chess pieces as follows:
190 REM **  VALUE     PIECE TYPE
200 REM **    0       Blank square
210 REM **    1       Black pawn
220 REM **    2       Black knight
230 REM **    3       Black bishop
240 REM **    4       Black rook
250 REM **    5       Black queen
260 REM **    6       Black king
270 REM **    7       White pawn
280 REM **    8       White knight
290 REM **    9       White bishop
300 REM **   10       White rook
310 REM **   11       White queen
320 REM **   12       White king
330 REM **           **
340 DATA 255,255,255,255,255,255,255,255,255,255,255,255,255,255,255,255
350 DATA 255,255,253,245,255,255,255,127,245,253,213,255,127,255,95,255
360 DATA 255,253,245,213,255,255,127,127,253,245,213,255,127,127,95,255
370 DATA 255,253,247,223,255,255,127,223,215,245,213,255,95,127,95,255
380 DATA 255,221,213,245,255,223,95,127,245,213,213,255,127,95,95,255
390 DATA 255,221,247,253,255,223,127,255,215,213,213,255,95,95,95,255
400 DATA 255,253,245,253,255,255,127,255,245,213,213,255,127,95,95,255
410 DATA 255,255,254,250,255,255,255,191,250,254,234,255,191,255,175,255
420 DATA 255,254,250,234,255,255,191,191,254,250,234,255,191,191,175,255
430 DATA 255,254,251,239,255,255,191,239,235,250,234,255,175,191,175,255
440 DATA 255,238,234,250,255,239,175,191,250,234,234,255,191,175,175,255
450 DATA 255,238,251,254,255,239,191,255,235,234,234,255,175,175,175,255
460 DATA 255,254,250,254,255,255,191,255,250,234,234,255,191,175,175,255
470 REM ** The following lines poke the new character data into the
480 REM ** new Character Set, using that area of the Set reserved
490 REM ** for lower-case characters.
500 FOR I=0 TO 414 STEP 2
510 READ A:POKE F+I+512,A:POKE F+I+513,A:NEXT I
520 REM ** The following lines store the chess board in string A$, using
530 REM ** the same values for pieces shown for the character set data.
540 DATA 4,2,3,5,6,3,2,4,1,1,1,1,1,1,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
550 DATA 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,7,7,7,7,7,7,7,7,10,8,9,11,12,9,8,10
560 RESTORE 540
570 FOR I=1 TO 64:READ A:POKE ADR(A$)+I,A:NEXT I
580 REM ** The following lines display the chess board on the screen.
590 GRAPHICS 12:REM ANTIC MODE 4
600 SETCOLOR 0,0,0:SETCOLOR 1,0,12:SETCOLOR 2,3,6:SETCOLOR 3,8,8:SETCOLOR 4,13,2
610 POKE 756,F/256:REM Switch on new character set
620 SCR=PEEK(88)+PEEK(89)*256:REM Address of top left corner of screen
630 FOR K=1 TO 64:REM For the 64 squares of the board
640 K2=4*PEEK(ADR(A$)+K):J=2*INT((K-1)/8):I=2*(K-4*J)
650 L=64:REM L points to 1st of the chess characters (where lower case used to be
660 IF INT((I+J)/4)<>(I+J)/4 THEN L=L+128:REM Change background colour for every   other square
670 K1=K2+L
680 I=I+10:J=J+2:REM Horizontal and vertical positions
690 POKE SCR+I+40*J,K1:REM Display the four parts of the piece
700 POKE SCR+(I+1)+40*J,K1+1
710 POKE SCR+I+(J+1)*40,K1+2
720 POKE SCR+(I+1)+(J+1)*40,K1+3
730 NEXT K
```

Get it right!

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
10	5804	20	2546	30	17327
40	21122	50	18662	60	17707
70	9556	80	3819	90	3457
100	2039	110	2299	120	4262
130	1345	140	4855	150	12828
160	9598	170	18323	180	10629
190	4905	200	5514	210	4835
220	5424	230	5472	240	4835
250	5344	260	4801	270	4991
280	5580	290	5628	300	4988
310	5497	320	4954	330	2431
340	10527	350	10251	360	10222
370	10116	380	9944	390	9979
400	10109	410	10487	420	10461
430	10480	440	10501	450	10503
460	10482	470	17995	480	10328
490	8721	500	3797	510	7907
520	17894	530	17664	540	9863
550	10604	560	2146	570	8184
580	17891	590	5571	600	14629
610	10711	620	16136	630	11373
640	8639	650	20431	660	21202
670	1312	680	13046	690	14160
700	4319	710	4274	720	4693
730	1349				

MANC

Give your computer an opportunity to think for itself with this game playing program by DAVID REEVES which simulates the process of human learning



UNA

THIS game-playing program is basically an exercise in artificial intelligence. Unlike most game-playing programs however, this one is different in that the computer actually learns as it goes along.

The program partly simulates human learning as the computer remembers positions which led it to lose, and then, given the opportunity, plays these back against its opponent.

The game is a simplified version of an Arabic game called Mancuna. I chose this game for the exercise because it is fairly challenging while not being too complex and it may also be new to many people.

This simple version is played by two players using eight counters on a 2 × 2 square board. The game begins with two counters on each square, and the players face each other across the board.

Taking turns, each player picks up the counters from one square on his/her side of the board and moves them anticlockwise round the board putting one counter on to each square in turn until they are exhausted.

Thus if one player picks up three counters from the bottom left square he must put one counter on the bottom right, one on the top right, and the last one on the top left, leaving no counters on the original square. The winner is the first player to have all eight counters on his/her side of the board.

The program allows you to play against the computer. On your turn move the joystick left or right to choose the square you want to move from, and then press the fire button.

At the start the computer is totally naive, knowing only the rules of the game. Each time it loses, the computer remembers the position which led it into a losing sequence of moves. In future it will avoid getting into this position itself, but will put you into it if it can.

Humans also learn like this – but unlike a human the computer learns nothing from winning, nor can it formulate general rules of strategy to guide its play.

Against this however, the computer does have the advantage that it never forgets positions which it knows must lead to a loss, or those which must lead to a win. It learns rapidly from its mistakes.

After five losses it is quite a fair player, and after 10 it can be difficult to beat. Try playing it 'the first one to 10 wins', and see who learns quickest.

The program works on the principle of giving a code of 1 to positions which lead to losses, and 2 to those that lead to wins. Initially all positions have a code of 0.

Whenever it loses, the computer recalls the last position it created which had an unknown outcome, that is coded 0. That position is then given a code of 1 so that the computer knows not to create it again.

Next, all possible positions from which that position can be created are computed. If it is found that all moves made from one of these positions lead to losses the position receives a code of 2, so that given the opportunity the computer will create the position, knowing that it leads to a certain win.

In this way, as the number of its losses increases the computer identifies moves leading to losing sequences earlier and earlier, and learns longer and longer winning sequences. If played against long enough it becomes a perfect player.

→

PROGRAM STRUCTURE

10-60	Initialise variables and screen.
80-240	Player's move.
260-300	Get ready for computer move.
310-320	Compute destinations for both possible moves by computer.
330-460	Computer's move. Random choice unless one move leads to a certain win or a certain loss.
470-490	Store position as "lastunpos" if not coded as win or loss.
500-700	If computer loses, code lastunpos as certain loss. Then compute positions which lead to lastunpos. For each of these determine both possible destinations, and if both lead to losses the position is a certain win – for the player. Compute the corresponding position for the computer (100×C+10×D+A) and code as a win.
710-790	End of game and initialise for next game.
800-890	Subroutine for coding winning positions.
900-990	Subroutine for setting up screen.
1000-1090	Subroutine for moving counters.

MAJOR VARIABLES

SQUARE	The squares are called 1, 2, 3, and 4 anticlockwise from bottom left.
A, B, C, D	Number of counters on squares 1, 2, 3, 4 respectively.
CODE(800)	Holds status codes for each position: 1=losing position, 2=winning position, 0=unknown. Positions are identified by computing 100×A+10×B+C.
DES(2)	The two possible positions which can arise from the next move.
DES1, DES2	Current status codes for DES(1) and DES(2).
LASTUNPOS	Last position created by computer with an unknown outcome.

```
10 GRAPHICS 18
20 DIM CODE(800),DES(2)
30 REM ** INITIAL VALUES **
40 A=2:B=2:C=2:D=2:ME=0:YOU=0:GO=1
50 FOR I=0 TO 800:CODE(I)=0:NEXT I
60 GOSUB 900
70 REM ** PLAYERS GO **
80 SQUARE=0
90 POSITION 12,1:PRINT #6;"your go":POSITION 12,3:PRINT #6;"        ":POSITION 12,4:PRINT #6;"        "
100 POSITION 2,1:PRINT #6;"■■■■■■■"
110 Z=STICK(0)
120 POKE 77,0
130 IF Z=11 THEN SQUARE=1:POSITION 2,9:PRINT #6;"xxx■■■■"
140 IF Z=7 THEN SQUARE=2:POSITION 2,9:PRINT #6;"■■■■xxx"
150 IF SQUARE=0 THEN 110
160 IF STRIG(0)=1 THEN 110
170 IF SQUARE=1 AND A=0 THEN POSITION 12,3:PRINT #6;"ha! ha! ":GOTO 90
180 IF SQUARE=2 AND B=0 THEN POSITION 12,3:PRINT #6;"ho! ho! ":GOTO 90
210 IF SQUARE=1 THEN N=A:A=0:POSITION 3,7:PRINT #6;A
220 IF SQUARE=2 THEN N=B:B=0:POSITION 7,7:PRINT #6;B
230 GOSUB 1000
240 IF A=0 AND B=0 THEN POSITION 12,1:PRINT #6;" i win!":ME=ME+1:GOTO 710
250 REM ** COMPUTERS GO **
260 POSITION 12,2:PRINT #6;"        "
270 POSITION 12,1:PRINT #6;" my go ":POSITION 12,3:PRINT #6;"LET ME":POSITION 12,4:PRINT #6;"SEE..."
280 POSITION 12,2:PRINT #6;"        "
290 POSITION 2,9:PRINT #6;"■■■■■■■"
300 FOR W=1 TO 400:NEXT W
310 DES(1)=100*(A+INT((C+2)/4))+10*(B+INT((1+C)/4))+INT(C/4)
320 DES(2)=100*(A+INT((3+D)/4))+10*(B+INT((2+D)/4))+(C+INT((1+D)/4))
330 DES1=CODE(DES(1)):DES2=CODE(DES(2))
340 IF C=0 THEN SQUARE=4:DES1=1:GOTO 410
350 IF D=0 THEN SQUARE=3:DES2=1:GOTO 410
360 IF DES1=2 THEN SQUARE=3
370 IF DES2=2 THEN SQUARE=4
380 IF DES1=1 THEN SQUARE=4
390 IF DES2=1 THEN SQUARE=3
400 IF DES1=0 AND DES2=0 THEN SQUARE=INT(3+2*RND(0))
410 IF SQUARE=3 THEN POSITION 2,1:PRINT #6;"■■■■xxx"
420 IF SQUARE=4 THEN POSITION 2,1:PRINT #6;"xxx■■■■"
430 FOR W=1 TO 100:NEXT W
440 IF SQUARE=3 THEN N=C:C=0:POSITION 7,3:PRINT #6;C
450 IF SQUARE=4 THEN N=D:D=0:POSITION 3,3:PRINT #6;D
460 GOSUB 1000
470 POS=100*A+10*B+C:IF CODE(POS)<>0 THEN 500
480 LASTUNPOS=POS
490 A1=A:B1=B:C1=C:D1=D
500 IF C<>0 OR D<>0 THEN 80
510 POSITION 12,1:PRINT #6;"you win":YOU=YOU+1
520 CODE(LASTUNPOS)=1
530 IF C1<>0 THEN 570
540 C=1:D=D1-1:A=A1:B=B1:GOSUB 800
550 C=2:D=D1-1:A=A1-1:B=B1:GOSUB 800
560 C=3:D=D1-1:A=A1-1:B=B1-1:GOSUB 800
570 IF C1<>1 THEN 620
580 C=4:D=D1-1:A=A1-1:B=B1-1:GOSUB 800
590 C=5:D=D1-2:A=A1-1:B=B1-1:GOSUB 800
600 C=6:D=D1-2:A=A1-2:B=B1-1:GOSUB 800
610 C=7:D=D1-2:A=A1-2:B=B1-2:GOSUB 800
620 IF D1<>0 THEN 660
630 D=1:A=A1-1:B=B1:C=C1:GOSUB 800
640 D=2:A=A1-1:B=B1-1:C=C1:GOSUB 800
650 D=3:A=A1-1:B=B1-1:C=C1-1:GOSUB 800
660 IF D1<>1 THEN 710
670 D=4:A=A1-1:B=B1-1:C=C1-1:GOSUB 800
680 D=5:A=A1-2:B=B1-1:C=C1-1:GOSUB 800
690 D=6:A=A1-2:B=B1-2:C=C1-1:GOSUB 800
700 D=7:A=A1-2:B=B1-2:C=C1-2:GOSUB 800
710 REM ** END OF GAME **
720 FOR W=10 TO 35:SOUND 0,40*RND(0),10,100/W:SOUND 1,20*RND(0),10,100/W:NEXT W:SOUND 0,0,0,0:SOUND 1,0,0,0
730 POSITION 12,10:PRINT #6;ME:POSITION 16,10:PRINT #6;YOU
740 POSITION 12,3:PRINT #6;" PRESS ":POSITION 12,4:PRINT #6;" FIRE  "
750 IF STRIG(0)=1 THEN 750
760 A=2:B=2:C=2:D=2
770 GOSUB 900
780 GO=1-GO:IF GO=1 THEN 80
790 GOTO 260
800 REM ** CODE WINNING POSITIONS **
810 IF A<0 OR B<0 OR C<0 OR D<0 THEN 890
830 DES(1)=100*(A+INT((C+2)/4))+10*(B+INT((C+1)/4))+INT(C/4)
840 DES(2)=100*(A+INT((D+3)/4))+10*(B+INT((D+2)/4))+(C+INT((D+1)/4))
850 DES1=CODE(DES(1)):DES2=CODE(DES(2))
860 IF C=0 THEN DES1=1
870 IF D=0 THEN DES2=1
880 IF DES1=1 AND DES2=1 THEN POS=100*C+10*D+A:CODE(POS)=2
890 RETURN
900 REM ** SET UP SCREEN **
910 POSITION 4,0:PRINT #6;"ME":POSITION 4,10:PRINT #6;"YOU"
920 POSITION 12,10:PRINT #6;ME:POSITION 16,10:PRINT #6;YOU
930 POSITION 1,1:PRINT #6;"■■■■■■■■■":POSITION 1,9:PRINT #6;"■■■■■■■■■"
940 FOR I=2 TO 8:POSITION 1,I:PRINT #6;"■   ■   ■":NEXT I
950 POSITION 1,5:PRINT #6;"■■■■■■■■■"
960 POSITION 13,8:PRINT #6;"score"
970 POSITION 12,9:PRINT #6;"ME  YOU"
980 POSITION 7,3:PRINT #6;A:POSITION 7,7:PRINT #6;B:POSITION 3,7:PRINT #6;C:POSITION 3,3:PRINT #6;D
990 RETURN
1000 REM ** MOVE COUNTERS **
1010 SQUARE=SQUARE+1:IF SQUARE>4 THEN SQUARE=1
1020 FOR W=1 TO 70:NEXT W:SOUND 0,80,10,9:FOR W=1 TO 10:NEXT W:SOUND 0,0,0,0
1030 ON SQUARE GOSUB 1060,1070,1080,1090
1040 N=N-1:IF N<1 THEN RETURN
1050 GOTO 1010
1060 A=A+1:POSITION 3,7:PRINT #6;A:RETURN
1070 B=B+1:POSITION 7,7:PRINT #6;B:RETURN
1080 C=C+1:POSITION 7,3:PRINT #6;C:RETURN
1090 D=D+1:POSITION 3,3:PRINT #6;D:RETURN
```

Get it right!

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
10	2152	20	3346	30	4712
40	5971	50	5737	60	1901
70	3777	80	1701	90	17607
100	9000	110	2020	120	1797
130	12431	140	12201	150	3809
160	3749	170	12393	180	12440
210	9364	220	9378	230	1925
240	13342	250	4194	260	5379
270	18077	280	5379	290	9024
300	3931	310	8705	320	10123
330	6429	340	6885	350	6890
360	4527	370	4534	380	4526
390	4525	400	8932	410	11746
420	11460	430	3922	440	9376
450	9382	460	1925	470	7475
480	3133	490	3632	500	4101
510	8719	520	3681	530	2772
540	5450	550	5578	560	6124
570	2767	580	6128	590	6133
600	6140	610	6149	620	2776
630	5456	640	5583	650	6129
660	2771	670	6133	680	6138
690	6145	700	6154	710	3562
720	17844	730	10702	740	12011
750	3763	760	2702	770	1901
780	4389	790	1628	800	6453
810	6144	830	8669	840	10015
850	6429	860	3298	870	3305
880	9793	890	1498	900	4173
910	13591	920	10702	930	20528
940	10189	950	10159	960	8288
970	8620	980	18462	990	1498
1000	4399	1010	8354	1020	12836
1030	6306	1040	4849	1050	1852
1060	7442	1070	7461	1080	7456
1090	7459				

Your disc data on tap

. . . with the aid of this utility by DOUGLAS EWAN

THOSE of us who started with DOS 3 and have subsequently changed to the new DOS 2.5 will at some time wish to have a printout of files contained on a disc.

While this was possible with DOS 3 the option seems to be omitted on the newer operating system. You can however get a printout of disc files with Atari Writer but like DOS 3 this presents you with a not-too-neat three inch strip, a bit off if you have an 80 column printer.

This disc index printout utility resolves these problems and allows you to neatly catalogue your disc directories on standard A4 paper. In addition it allows the directory to be named, disc numbered, and side identified. The program also summarises the number of files, the used sectors, and the free sectors.

The program was written on my 130XE but works fine on an 800XL. It was designed for the Atari 1027 printer but works with an Epson FX-80 and should do so quite happily on any other 80 column printer.

As the layout of the directory is dependent on the number of blank spaces in the PRINT statements I've included some REM statements to help get it right.

They refer to the line immediately following – for example the statement in line 179 refers to the layout of line 180. None of the REMs are necessary and you can omit those lines if you want to save yourself some typing.

```
                 ATARI 130XE   DISK DIRECTORY
     DOS 2.5 MASTER (side B not used)        Disk No.U03     Side A

 * DOS......SYS (037)    * DUP......SYS (042)    * RAMDISK..COM (009)
 * SETUP....COM (070)    * COPY32...COM (056)    * DISKFIX..COM (057)
 * MINIMAN..... (144)    * DOSMAN...... (034)      ATNEWS...... (034)
   ATNEWS2..... (143)

     10 FILES            526 USED SECTORS          081 FREE SECTORS


                 ATARI 130XE   DISK DIRECTORY
     DOS 2.5 (copy) & UTILITIES              Disk No.U04     Side A

 * DOS......SYS (037)    * DUP......SYS (042)    * RAMDISK..COM (009)
 * SETUP....COM (070)    * COPY32...COM (056)    * DISKFIX..COM (057)
 * MINIMAN..... (144)    * DOSMAN...... (034)    * BLINE....BAS (019)
 * RAMCHECK.SYS (003)    * RAMCHECK.BAS (013)    * REVIVE...SYS (002)
 * REVIVE...BAS (013)    * MENU........ (024)    * AUTORUN..SYS (005)
 * TRANSFER.BAS (022)    * TRANSFER.SYS (004)    * RENUM....BAS (017)
 * DISKDIR..BAS (023)      CHSUM....BAS (015)    * AUTORUN..UTL (013)

     21 FILES            622 USED SECTORS          308 FREE SECTORS


                 ATARI 130XE   DISK DIRECTORY
     GAMES (BASIC) DOS 2.5                   Disk No.U04     Side B

   DOS......SYS (037)      DUP......SYS (042)      DRAGON...... (135)
   MENU........ (024)      SKIRUN...V1. (028)      WARRIOR..... (041)
   THIEF....... (016)      THIEF....001 (079)      AUTORUN..SYS (002)
   JUMPING..... (032)      SKIRUN...V2. (047)      BATS........ (068)
   TOWER....... (123)      MAZE........ (022)      STEWARD..... (049)
   GOLDRUN..... (093)      PROSPEC..... (043)      TREASURE.... (040)
   RAMMENU..... (024)      RAMDISK..COM (009)

     20 FILES            954 USED SECTORS          056 FREE SECTORS
```

```
10 REM *** DISK INDEX UTILITY ***
20 REM ***   by Douglas Ewan  ***
30 GOSUB 400
40 POKE 82,0:POKE 83,39:POKE 752,1
50 DIM A$(40),D$(3),Q$(1),R$(40),S$(1)
,U$(4),X$(4):Y=18:GOTO 370
60 GOSUB 480:PRINT "Reference ";:R$=""
:INPUT R$
70 Y=15:X=LEN(R$):POSITION 20-(X/2),5:
PRINT R$
80 GOSUB 480:PRINT "Disk No.  ";:INPUT
 D$
90 X=LEN(D$):POSITION 15-(X/2),7:PRINT
 ;"Disk No. ";D$
100 GOSUB 480:PRINT "Side A/B  ";:INPU
T S$
110 POSITION 17,9:PRINT ;"Side ";S$
120 GOSUB 480:PRINT "REDO <Y>es ";:INP
UT Q$:IF Q$="Y" THEN Y=5:GOTO 60
130 GOSUB 480
139 REM 40 SPACES BETWEEN QUOTES
140 IF LEN(R$)<40 THEN R$(LEN(R$)+1,40
)="
    "
150 IF LEN(D$)<3 THEN D$(LEN(D$)+1,3)=
"   "
160 TRAP 500:OPEN #2,8,4,"P:":TRAP 510
:OPEN #1,6,0,"D:*.*":TRAP 520
169 REM 26 SPACES BEFORE ATARI
170 PRINT #2;"
  ATARI 130XE   DISK DIRECTORY":PRINT
#2:N=0:S=0
179 REM 8 SPACES BETWEEN QUOTES, 6 SPA
CES BEFORE SIDE
180 PRINT #2;"        ";R$;" Disk No."
;D$;"      Side ";S$:PRINT #2:PRINT #2
:GOTO 220
190 N=N+1:S=S+VAL(A$(15,17))
200 FOR I=3 TO 13:IF A$(I,I)=" " THEN
A$(I,I)="."
210 NEXT I:RETURN
220 INPUT #1;A$
230 IF A$(5,8)="FREE" THEN GOTO 290
240 GOSUB 190
250 PRINT #2;A$(1,10);".";A$(11,13);"
(";A$(15,17);")";
259 REM 9 SPACES BETWEEN QUOTES
260 IF INT(N/3)<N/3 THEN PRINT #2;"
    ";
270 IF INT(N/3)=N/3 THEN PRINT #2
280 GOTO 220
290 X$=STR$(S):X=LEN(X$):U$="    ":U$(
5-X,4)=X$
299 REM 8 SPACES BETWEEN QUOTES
300 PRINT #2:PRINT #2:PRINT #2;"
 ";N;" FILES";
309 REM 13 SPACES BETWEEN QUOTES
```

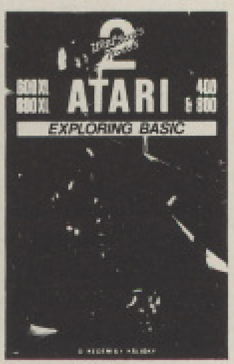


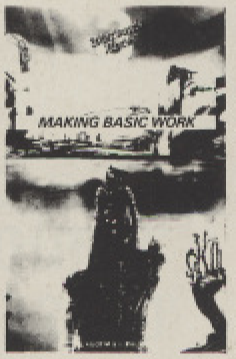
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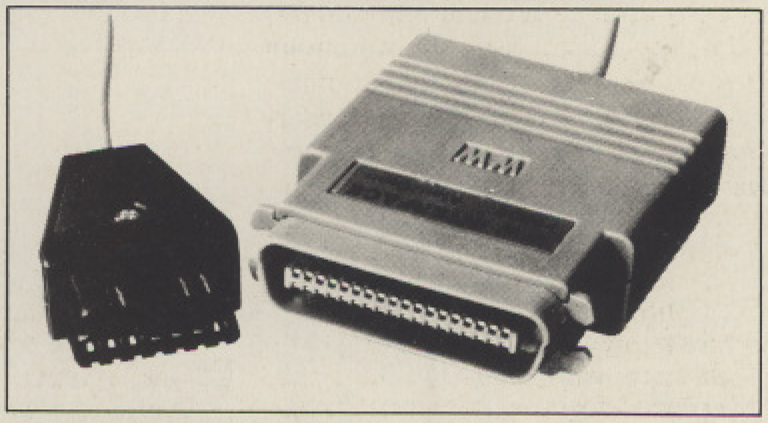
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DEALER ENQUIRIES MOST WELCOME

```
310 IF N<10 THEN PRINT #2;"
  ";
319 REM 12 SPACES BETWEEN QUOTES
320 IF N>9 AND N<100 THEN PRINT #2;"
         ";
329 REM 11 SPACES BETWEEN QUOTES
330 IF N>99 THEN PRINT #2;"
";
339 REM 11 SPACES AFTER SECTORS
340 PRINT #2;U$;" USED SECTORS
  ";A$
350 PRINT #2:PRINT #2:PRINT #2:PRINT #
2:PRINT #2:CLOSE #1:CLOSE #2
360 POSITION 1,12:PRINT ;N;" FILES  ";
U$;" USED / ";A$
370 GOSUB 480:PRINT "   INSERT DISK AN
D PRESS ANY KEY"
380 OPEN #3,4,0,"K:"
390 GET #3,K:CLOSE #3:POSITION 0,5:Y=5
:GOTO 60
400 GRAPHICS 0:SETCOLOR 2,4,4
410 DL=PEEK(560)+PEEK(561)*256
420 POKE DL+3,70
430 FOR A=0 TO 4:POKE DL+A+6,6:NEXT A
440 POKE 87,2:PRINT #6;"UTILITY  PROGR
AM"
450 POSITION 0,2:PRINT #6;"disk index
print out"
460 POSITION 0,4:PRINT #6;"  BY  DOUGL
AS EWAN"
470 POKE 87,0:RETURN
479 REM 40 SPACES BETWEEN QUOTES
480 FOR I=18 TO Y STEP -1:POSITION 2,I
:PRINT "
            ";:NEXT I
490 POSITION 2,15:RETURN
499 REM 6 SPACES BEFORE PRINTER
500 GOSUB 480:PRINT "      PRINTER DID
 NOT RESPOND":GOTO 530
509 REM 4 SPACES BEFORE DISK
510 GOSUB 480:PRINT "    DISK DRIVE DI
D  NOT RESPOND":GOTO 530
519 REM 12 SPACES BEFORE DISK
520 GOSUB 480:PRINT "            DISK
 ERROR":GOTO 530
530 CLOSE #1:CLOSE #2:FOR I=1 TO 1000:
NEXT I:GOTO 120
```

Tired of typing?
Take advantage of our finger-saving offer on Page 44.

Get it right!

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
10	5400	20	6078	30	1886
40	5618	50	9647	60	9257
70	8040	80	7719	90	9444
100	7445	110	6162	120	12677
130	1918	139	5750	140	9963
150	6391	160	10940	169	5112
170	13158	179	9920	180	14257
190	4279	200	7076	210	3164
220	2038	230	5326	240	1913
250	7508	259	5508	260	6729
270	5464	280	1616	290	7334
299	5507	300	8574	309	5763
310	5688	319	5751	320	7120
329	5749	330	5451	339	5472
340	6413	350	11814	360	8868
370	9826	380	2696	390	8061
400	5023	410	4453	420	2195
430	6005	440	7139	450	10373
460	7788	470	3323	479	5760
480	13486	490	4216	499	5502
500	10479	509	5006	510	11187
519	5005	520	8480	530	9208

But is Prestel all you need?

MY 1050 was supplied with DOS 3.0. How does it compare with DOS 2.5?

What is the minimum I need to use my Atari to get Prestel? The Miracle Modem is expensive at £195 compared with the offer currently made by Bank of Scotland at £95 for a separate system. – **Simon Firth, Maidstone.**

● Use DOS 2.5 if you get the chance. It is much more efficient in terms of memory, disc storage space and time taken to operate a given function.

DOS 3 is very user-friendly, but this is where it falls down, since once you know how to use it the prompts and defaults system proves very time-consuming.

See the review in the July 1985 issue of *Atari User* for more details.

If you just want to use Prestel then you are right – a dedicated unit would be far cheaper than a computer interface and modem.

However the Miracle Modem offers so much more – MicroLink, bulletin boards, inter-computer communication, and so on.

Which unit you should buy depends on what you want to use it for, and perhaps more importantly, what you may want to use in the future.

Best buy printer

I HAVE found that there are very few people in my area with Atari computers since I got my 800XL at Christmas, and was wondering if you could please print the address of the nearest Atari Users Club to my home address.

I would also like to know if it is possible to buy a cheaper printer than the Atari 1029 which costs £197.90, and buy an interface lead to make it compatible with my 800XL. – **Jonathan Curle, Bath.**

● There are printers cheaper than the 1029, the replacement for the 1025 which was never made available.

However you'd need an interface for them which would knock the cost back up again.

Atari's own printers are about the cheapest to run with Atari computers.

You could, of course, get the 1027 letter quality printer or the 1020 printer/plotter, which is less than £100, but have a good look at that one first as it can't use anything wider than 4in roll paper.

Atari's own

I AM going to buy a 130XE and disc drive – I currently own an 800 and ancient 410 cassette recorder.

When I have bought this system I would like to purchase a printer. Please could you tell me one which will match up to the following specifications:

Be able to print on A4 size paper, have friction feed, have the ability to do screen dumps and cost around £200 or less. I am not too concerned about noise or printing speed. – **Andrew Young, Mitcham.**

● Why not take a look at Atari's own 1029 printer? It has the advantage that it is completely compatible with your system.

Search for an Indus

I HAVE bought the new Atari 130XE, a cassette drive and a television. I now want to get a disc drive and have decided to buy the Indus G.T.

The problem is that I can't find any shop which sells the Indus in this country. I have thought of importing it from America.

Is there a shop which repairs the Indus in this country? – **Hardev Kambo, Middlesex.**

● The Indus GT is a superb disc drive, but you will find great difficulty in obtaining it and maintaining it in the UK.

Before it went bankrupt, the Home Entertainment Atari Centre in Broad Street, Birmingham, imported a limited quantity, but the prices proved to be prohibitive (around £400), and service cover could not be provided.

I would say your best bet would be to purchase an Atari 1050 drive for which there is excellent service cover, and fit a US Doubler (£79.95), which will provide you with all of the densities that the Indus can offer.

OK, so you don't get the pretty lights on the front panel, but are they really worth about £200, and no service cover?

I have done this, and am very happy indeed with the results – especially the three-fold speed improvement.

André Willey

Wiring worries

I USED to have an Atari 600XL and the computer to television lead was just a wire with a plug on each end.

I have just bought an 800XL and the cable to the TV has a small black box a little way along it. Do you know what this is for?

Would an ordinary computer-TV cable work with my computer?

Also do you know if there is any difference between Atari Pole Position and the one imported by US Gold? – **Peter Goulden, Lincoln.**

● The black box in your cable is simply a ferrite core, a device which helps to reduce interference.

You can use the old cable with no problems, although you might find that the picture is slightly less clear.

The game play on Atari's and US Gold's Pole Position is the same. Datasoft in the States bought the rights to the game when Atari relinquished them last year.

Thus US Gold now produces a version under licence from Datasoft, while the Atari one is basically a remnant from the old deal.

The game is the same in both cases except for the Datasoft or Atari banners.

Expansion plans

I HAVE an Atari 400 with 16k memory and am desperate to buy a 48k memory expansion unit, partly so that I can use my assembler written in Basic in hi-res graphics modes and also so I can play the latest memory-gobbling games.

Atari no longer make the units and none of the dealers I have rung can get hold of one.

Can you help? Someone in the country must have one to sell me!

How about a private advertisers section in Atari User, *then this sort of problem would be easy to solve.*

Also can you tell me of a flight simulator on cassette or ROM that I can use? – **S. Holder, London SW16.**

● We don't know of any flight simulator that will run in 16k – if anyone has found one, let us know.

On the memory point, the last price on 48k memory boards for Atari 400s was £80. Even if anyone had any left, it would still be cheaper to buy a new 800XL from Dixons – for which you would have a 64k machine with a real keyboard, a new recorder, five games and a new joystick.

You can then recoup some of your expense by selling your old 400/recorder/joystick to a friend, or via a local newspaper.

ATARI USER Mailbag

WE welcome letters from readers – about your experiences using the Atari micros, about tips you would like to pass on to other users . . . and about what you would like to see in future issues.

The address to write to is:

Mailbag Editor
Atari User
Europa House
68 Chester Road
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Maze Munch score

I ENJOYED Maze Munch, your best game-listing to date. However the score does not increment on-screen (it's POKEd) when run on the 600XL, whereas it works perfectly on an 800XL.

Is this connected with a bug in Atari ROM at PEEK (43234) which is responsible for unnecessary Error 9 reports and worse still, causes keyboard lock ups with total loss of program control?

The value of this address on the 600XL is 96. It should be 234. Are there any 600XLs with the bug-free Rev C Basic available, as I have had problems with a few other listings and commercial tapes?

Finally, here is a short routine for readers to experiment with, or add to a program:

```
10 FOR Z=0 TO 255
20 FOR DE=1 TO 60:NEXT DE
30 SOUND 0,255,10,10:SOUND 1,255,10,7
40 POKE 53760,Z:NEXT Z
```

– **M.A. Phillips, Bristol.**

● Your problem is much more likely to be caused by lack of memory than by the error 9 bug. To the best of our knowledge, however, none of the UK 800XLs or 600XLs have Rev C Basic in them.

This is only available on the 130XE, or in cartridge form from main Atari dealers. If anyone has found differently, please let us know.

Cartridge port

I HAVE an Atari 400 and am thinking about buying the 130XE, but I am not sure if it has a cartridge port or not.

Second problem: I have a light pen made by Dams and wonder which joystick part it would connect to. – **Ross Oldfield, Dunstable.**

● Yes, the 130XE does have a cartridge port (at the back), and everything else that the 800XL has, plus 128k, of course. (See our review in issue 2.)

It only has two joystick ports, but then how many four-player games do you know?

The light pen, assuming it works with the Atari, can be plugged into port 1, or sometimes, on older 400s, port 4 – I don't know why.

You can PEEK locations 564 and 565 to get the x and y positions. These range from 0 to 228, but may need a little modification to correct the zero and maximum points for the edge of your TV set.

Use STICK(0) or STICK(3) to check for the pen button being pressed.

André Willey

Loading problems

I AM tired of Basic tapes. The problem is some just do not load at all.

For instance, I bought a pack of C15 Boots cassettes, I typed in a program and saved it, but it wouldn't load.

At the beginning of loading the cassette noise through the speakers usually makes a whistle. But on the Boots cassettes it does not make this sound.

Could you tell me which cassettes work and which do not? – **Chris Beard, Nottingham.**

● If your recorder has so far only been used to load games, you may find that your recorder is faulty and will not save, although it will load correctly.

Try saving to other tapes, such as TDK C-60, to see if this is the case.

If you still don't get anything take your recorder back for repair. If it does work, then your question is answered.

Price of memory

I AM pleased to see the efforts being made to increase Atari popularity, but feel that purchasers of the 600XL have been badly let down.

The 800XL has become available for approximately £100 and yet the memory expansion for the 600XL is still priced at approximately £90.

Have Atari any plans to make the expansion cheaper for the people who supported the launch of the XL range?

I think your magazine is superb and hope the standard set with the first three issues is maintained.

I would like, though, to make a couple of small points. Please include memory requirements when reviewing software and don't spoil the letters page by including "my score is higher than your score" letters. – **S. Harrington, Runcorn.**

K-Spread comments

HAVING just read the review of our program K-Spread for the Atari ST in the March issue of Atari User, we would like to make a few points known to your readers regarding some of the comments made. Some of this information was given to André Willey, however it obviously missed being mentioned in the review.

1: Copies of our ST applications software are now protected, however this does allow users to make a back-up copy for day-to-day use, it can also be copied to a hard disc without problems.

2: Two bugs were mentioned regarding the Save routine. The first does not exist, the second was only present on a few early discs and has since been rectified.

3: The version on sale checks for formulae when alterations are made, if no formulae are present the changes are accepted straight away. If there are formulae the user is presented with an option regarding changes.

4: We have an intensive development program under way and are working on a large number of added features. We have a positive upgrade policy whereby users of current versions will be able to upgrade to new versions at minimal cost.

5: Business graphics will be available when the data compatible program K-Graph is released towards the end of this quarter.

I hope you will be able to make this information available to your readers. We will of course keep you updated regarding new and improved products to our ST software range. – **Jon Day, Sales Manager, Kuma Software.**

● André Willey replies: I did get a new copy of the program – but the March issue containing the review was already at the printers.

As to Jon's points:

1: Fair enough. If Kuma can protect software and still allow use of a hard disc without

needing to use the master disc again, great. Good luck to them. It seems to work too.

2: The Give/Take bug does exist. If you GIVE a file with long text items in it, the TAKE does not retrieve the same information. This has been corrected on later revisions. The same applies to the "Can't drag cell on to desktop" bug. Both of these are present on a number of shop stock copies, although exchanges have now been arranged by Kuma.

3: Good. What else can I say?

4: Also good. The new version contains a couple of nice new features, including headers/footers, minus sign or brackets, an option to turn off the coloured backing to text fields, and a few others. Well done to Kuma for listening to their customers – not all companies do!

5: Strange, that's just what I said.

My conclusions still stand, anyway, and we're grateful to Jon for giving us an update on the situation.

Memory module

IN the February issue of Atari User *J.B. Giscott asked for information on the 64k memory module. Silica Shop (01-301 1111) will supply him with one.*

I think the best game available for Atari micros at present is Chimera by Firebird. It is a 3-D room game in a similar style to Alien 8 – only much, much better.

I'm sure any Atari owner would agree that the loading picture is better than anything ever seen before and the pause mode will shame even Colourspace.

Is it possible to use pictures generated on the Atari Touch Tablet in your own programs – for example an adventure game with graphics drawn on the tablet?

Lastly I must say I was shocked to hear you say that a very annoyed person's gerbils should be sautéd lightly and served in a white sauce.

Anyone knows that the best way to cook a gerbil is to grill it for 10-20 minutes, put a slice of cheese on it and put it in between two slices of bread! – **L. Wheelhouse, Sheffield.**

PS: *What is it about Rob Harding? He gets his picture in every issue.*

Good service

I AM not normally prone to putting pen to paper especially to compliment a company.

However my recent dealings with Compumart Ltd have prompted me to do so. As I am a regular reader of Atari User *it seemed the best place to voice my compliments.*

My initial dealings with Compumart was by way of an order for a 1027 Atari printer on special offer. On contacting the firm I received some very helpful advice and answers to my questions.

The order was promptly dispatched and arrived within 48 hours. However within a few weeks it was apparent that the printer was defective. On contacting Compumart they offered their apologies and an immediate replacement printer.

In addition they gave me the option of swapping the 1027 model with a 1029 dot matrix machine.

On reflection this should have been my initial choice. In doing this they will have to refund me money from the initial order.

It's so pleasant to find a company that really does have the customer at heart and the professionalism to match.

As a new Atari user, I am very confident that with Atari itself, shops like Compumart and the quality of Atari User *things could not look better.* – **M.S. Allen, Havant, Hants.**

Not so far Right!

I'M sure it must be libellous to describe my politics as "a little to the right of Genghis Khan" as Brillig, presumably Alex Bell hiding behind a pseudonym, did in the March Atari User. *Conservative MPs have sued the BBC for saying less!*

Fortunately, I'm just a wishy-washy Liberal voter so I'll be satisfied if you print this letter to correct the matter.

Brillig is equally wrong when he claims that any of Level 9's own adventures are based on existing books. They aren't – I do my damndest to avoid similarities when designing game worlds.

However when writing the introductions to games I have occasionally listed my favourite SF books on similar themes. For the benefit of readers, that's all.

To complete the list, Brillig describes the firing of particle-beam engines from an orbiting starship to destroy a target on the ground as being implausible.

Would that it were. Reagan's Starwars system proposes to use just this type of technology and, while there are difficulties in hitting thousands of fast moving warheads, a "surgical" first strike against a stationary target on the ground seems simple, given enough energy in the beam.

The fact that SDI could be used offensively is one reason why it would be so dangerous.

I've not seen the exact idea used before in SF, but Larry Niven proposed something similar in "The Warriors" ('Tales of Known Space' from Orbit). – **Peter Austin, Level 9 Computing.**

● As Alex would no doubt be at pains to point out after such a dressing-down, he does not write Brillig's adventure column.

That 'k' rating

I SUGGEST that you might ask your software advertisers to indicate the "k" rating of the games they advertise – 16k, 32k or whatever as I have found it an expensive exercise having to write to firms, enclosing an SAE to find out if a game is suitable for my 600XL.

Also could you please advise me if it is possible to obtain a RAM pack to upgrade to 48k. I have written to several firms but had no luck so far. Maybe some of your other readers could help me. – **B. Cottrell, Irvine, Ayrshire.**

● Silica shop should have the RAM pack, but at present-day costs you might be able to find an 800XL for less.

1020 and Atari Writer

WITH reference to the letter from E.C. Jones in the February issue of Atari User, I also had problems using the 1020 with Atari Writer. After much experimenting I found the following procedures solved them.

Select option 1 when asked for the type of printer. Then Put Ctrl-0 27 at the beginning of each instruction, in place of the ESC ESC in the 1020 instruction manual.

Then type Ctrl-O followed by the ATAscii number corresponding to the instruction.

*For example, to change to the red pen, instead of typing ESC ESC Ctrl-G * C3 * A, you would put Ctrl-0 27 Ctrl-0 7*C3*A.*

Finally, put text and graphics instructions on separate lines. – **Steven Burke, Bexley Heath.**

Attract mode

HAVING bought an Atari 800XL six weeks ago I find myself with a major problem. I am working on a football manager type game which is coming on well.

The problem is that after 10 minutes or so the screen changes colour when the program is running. The game is almost all joystick controlled as is Des Bells (from Atari User) which does the same thing.

Is there a poke or some way of preventing this change of colour?

I have just swapped my Spectrum to buy the Atari and I'm impressed to say the least after a year of the Spectrum. – **Steve Kennedy, Stranraer.**

● To prevent the attract mode you need to POKE 77,0 at regular intervals in your program.

Problems solved

I HAVE answers to two questions raised in February's Atari User Mailbag – and one question.

Patrick McDonald's problem on cassette loading technique could well be the location of his recorder. If it is within two feet of his TV or monitor the very strong magnetic field generated by this equipment will often corrupt data stored on magnetic tape.

I had the same problem and relocating the recorder away from the TV solved it.

He may or may not be lucky in salvaging the existing information on his tapes. Better buy a disc drive.

Mr A.G. Formoy's question on Bridge programs for the Atari is easily answered. I have two. Both are American and use the Goran convention which should present no difficulty to an experienced player.

They both include Blackwood for slam bidding and one of them keeps score including vulnerability.

Both my wife and I keep in practice by regularly playing bridge with our Atari. It doesn't drink either, or pay when it loses!

One program is by Artworx the other by CMC. I got them in the US but I'm sure they are available here from Software Express or Silica Shop.

If anyone wants more information they can call me on Tunbridge Wells 20694.

My question is when are we going to see a RAMdisc add-on for the 800XL to match the 130XE and when are software writers going to take advantage of this facility to add more features and effects to their programs?

Also I am looking for an 80 column word processor – I'm tired of my 40 column AtariWriter!

On last thing. Would you please give a plug to TWAG – the Tunbridge Wells Atari Group. – **A.C. (Tony) Chamberlain, Tunbridge Wells.**

Not worth changing . . .

AS a prospective Atari buyer and a current Commodore 64 owner, I was very interested to read in the February Atari User of the difficulties some of your readers have experienced with their Atari computers and hardware, particularly about the reader who considered changing to Commodore.

This is because since buying my Commodore 64 in August 1984 I have had to change it three times due to faults with the computer or missing accessories.

The CBM64 I finally settled for developed a fault with its SID chip and had to be sent for repair, taking seven weeks.

On the day I received it back, and having also bought a disc drive, I connected them up only to find the computer would not work with the disc drive.

I had to wait 15 weeks for the computer to be re-repaired.

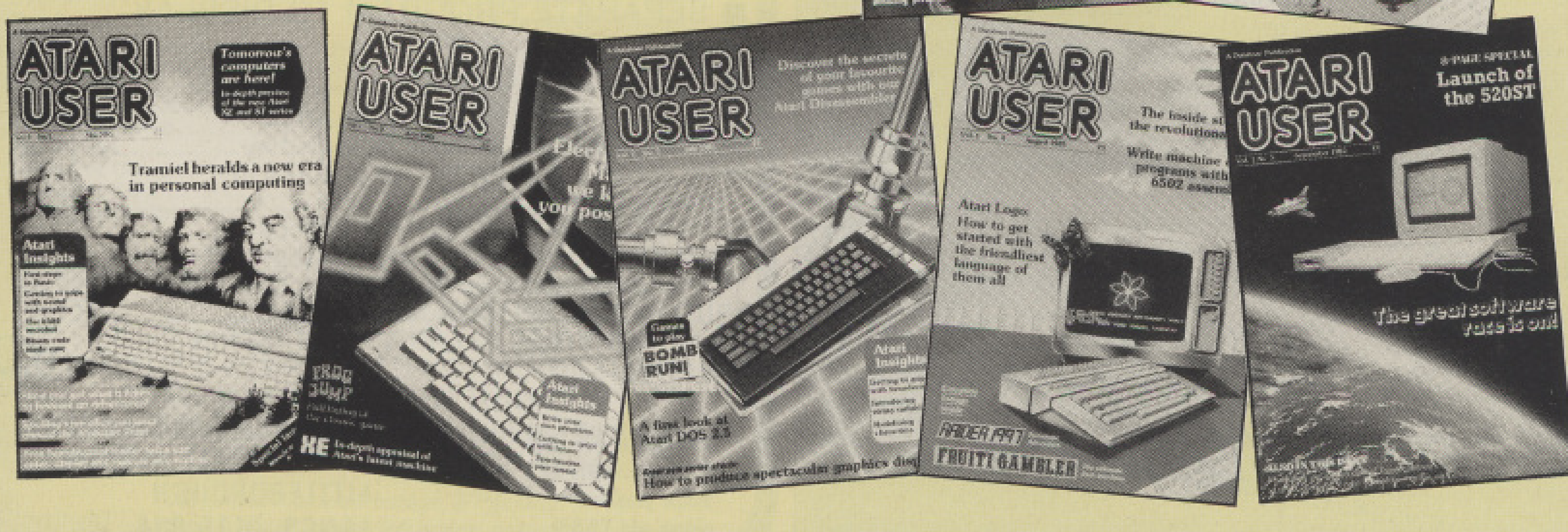
I hope your readers will see that it is not just Atari who have problems, and that, if Atari's future looks exciting then the prospects of other computer manufacturers look positively retrogressive. – **Sanjan Maharaf, London N3.**

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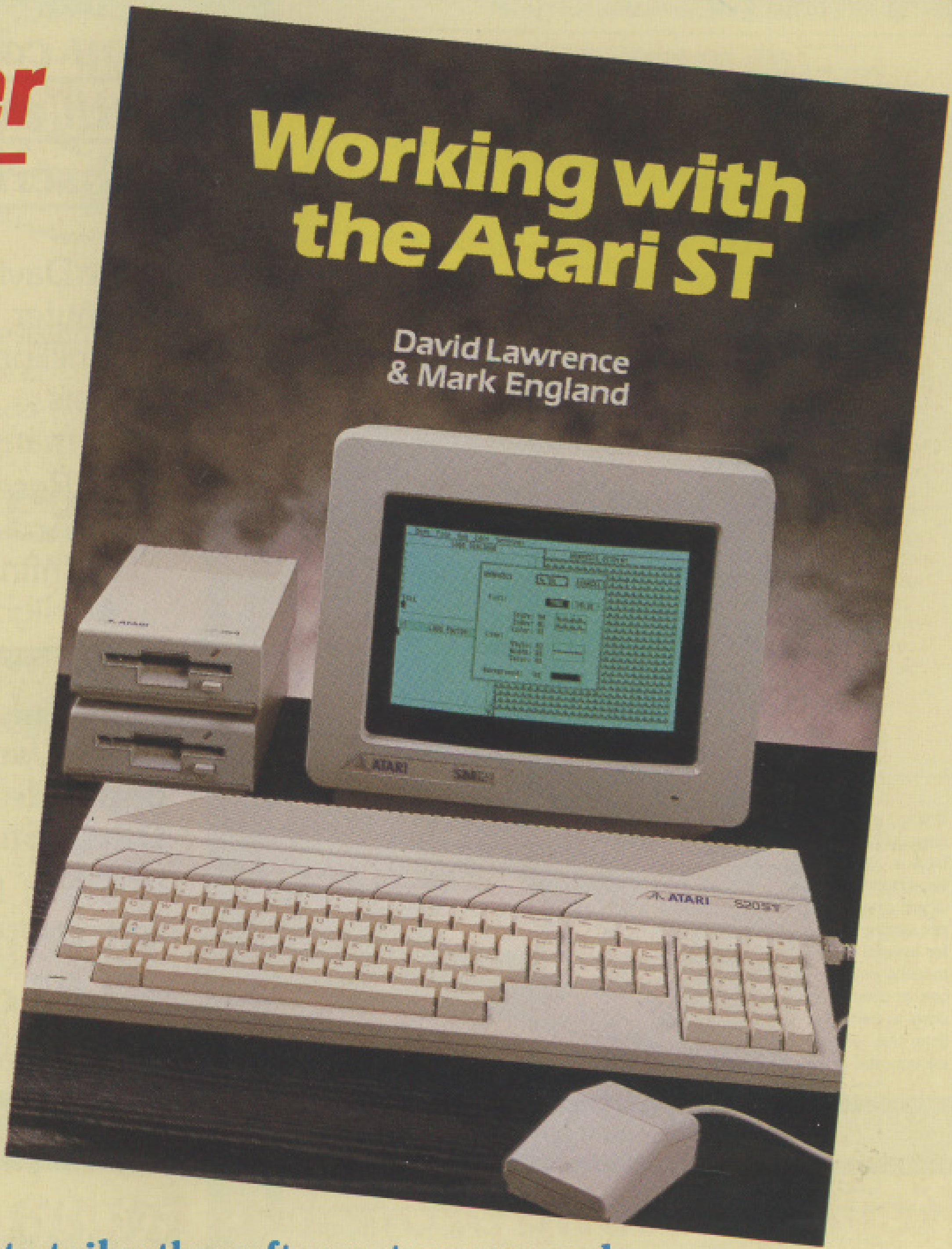


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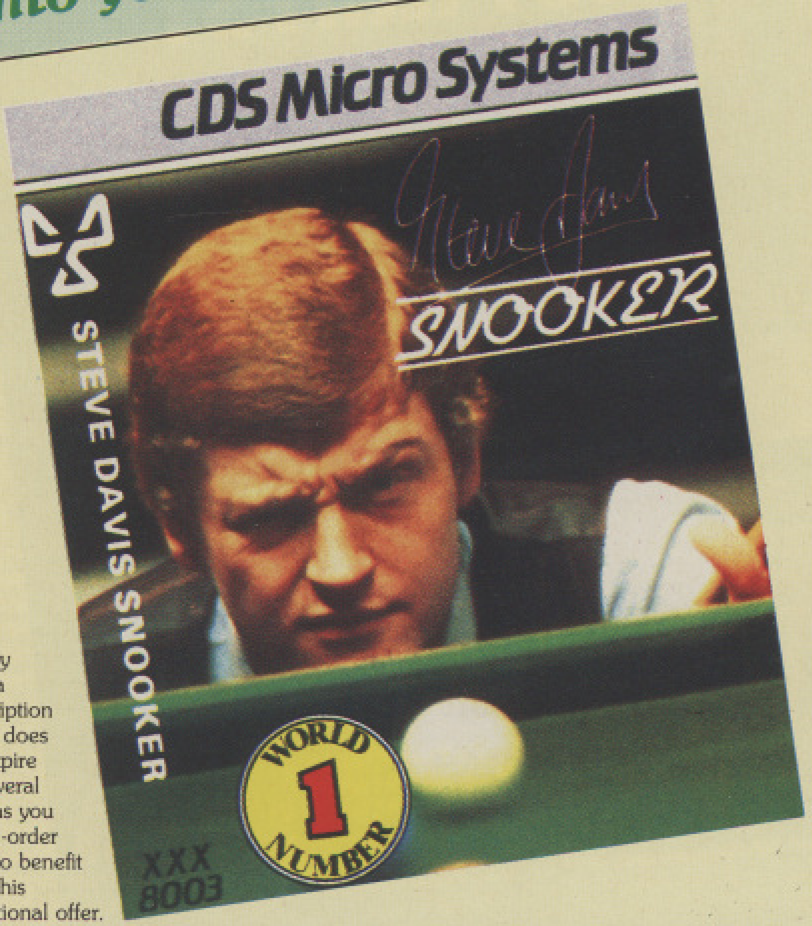
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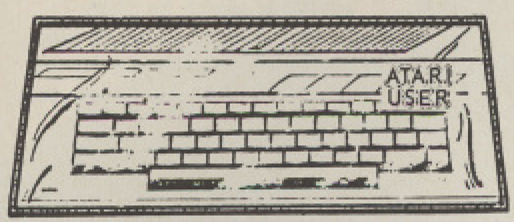
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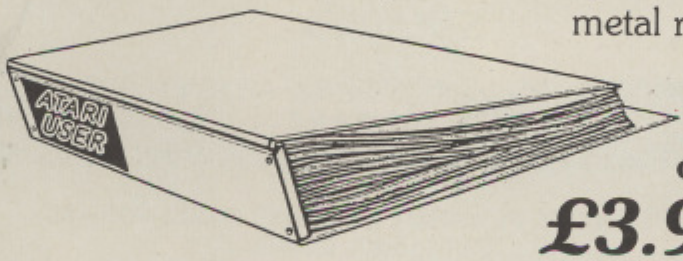
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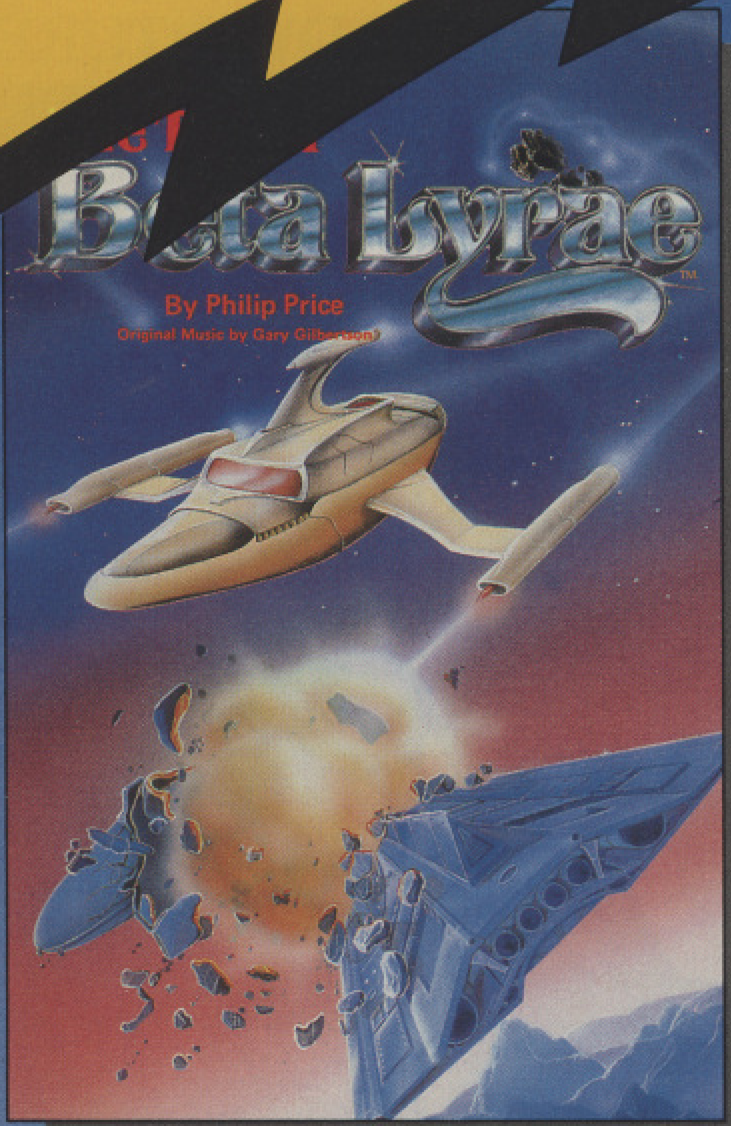
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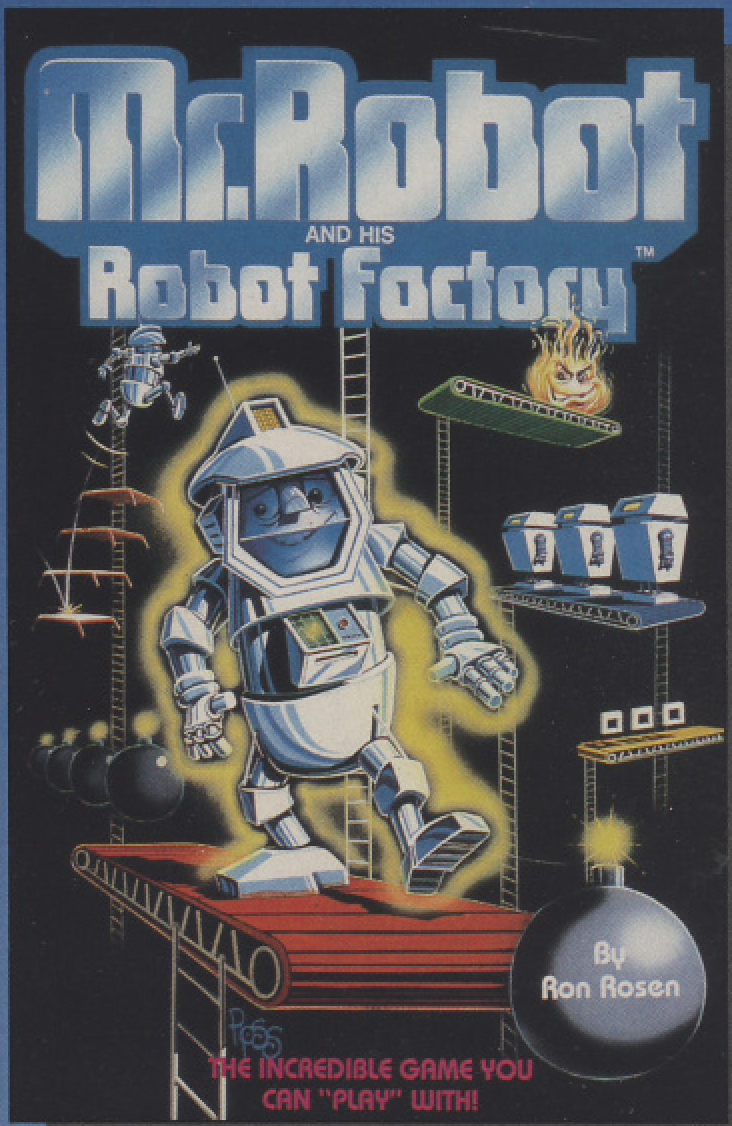
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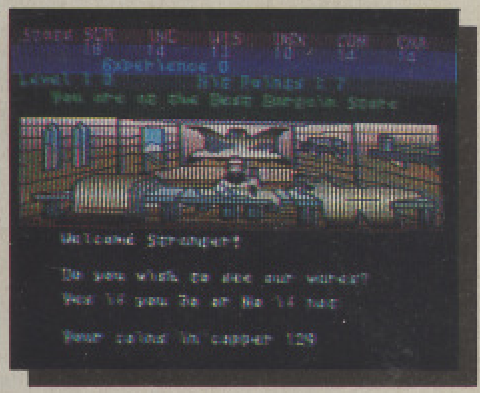
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